BILL JACKSON
GARY SMILLIE

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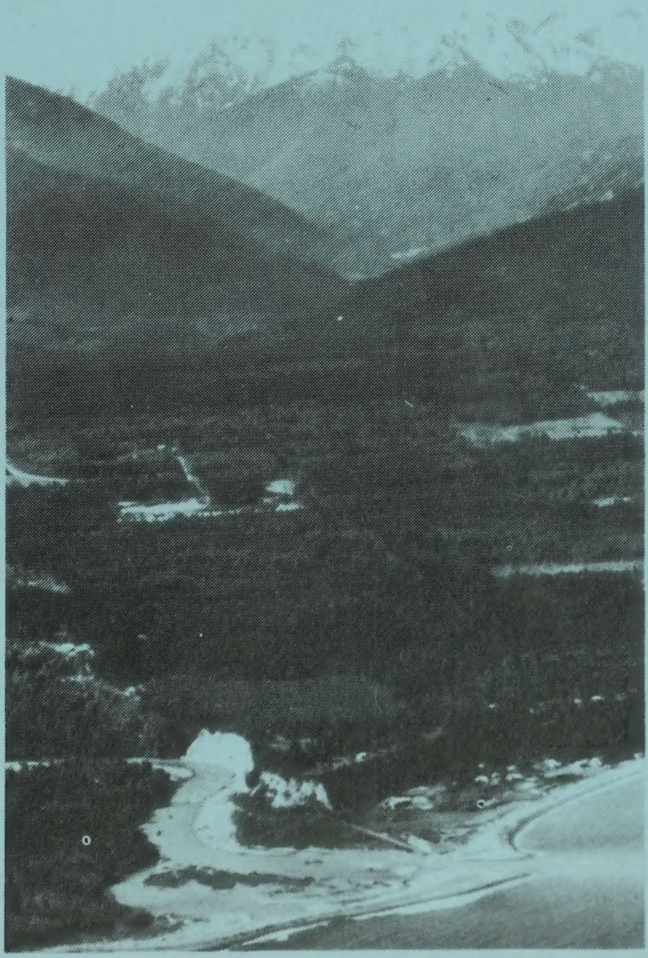
Federal Energy Regulatory Commission

Office of Hydropower Licensing

March 1993

DRAFT STAFF REPORT

Volume 2 - Responses To Comments



Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington

(Photograph courtesy of James River II)

FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON, D. C. 20426

TO THE PARTIES ADDRESSED:

The Secretary, United States Department of the Interior (Secretary) by letter dated December 31, 1992, requested that factual information, associated with the final environmental impact statement (EIS) that the Staff of the Federal Energy Regulatory Commission (Commission) is preparing on the Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) hydroelectric projects, be made available to the agencies preparing a report to Congress (Public Law 102-495). The Secretary's report concerns the full restoration of the Elwha River ecosystem and native anadromous fisheries.

The attached draft staff report is being made available to the Secretary's study team and all parties to the Elwha and Glines Canyon proceeding.

The draft staff report is not the Commission's staff final EIS nor does it reflect the views of the Commission.

The Commission's licensing proceeding remains open pending further action by Congress after the secretary issues his report. Any further decisions about release of a Final EIS or other actions in the proceeding are being deferred at least until such time as the report is issued.

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STAFF REPORT

FERC/FEIS-0059F

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF HYDROPOWER LICENSING

FINAL ENVIRONMENTAL IMPACT STATEMENT
VOLUME 2 - RESPONSES TO COMMENTS

PROPOSED ELWHA (FERC NO. 2683)
AND GLINES CANYON (FERC NO. 588)
HYDROELECTRIC PROJECTS,
WASHINGTON

Applicant: James River II, Inc.

Additional copies of this FEIS are available from:

Division of Public Information
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, D.C. 20426

October 1992

LETTERS OF COMMENT ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT AND FERC STAFF RESPONSES

The Notice of Availability of the draft environmental impact statement (DEIS) was published in the Federal Register on March 1, 1991. The DEIS was mailed to federal, state, and local agencies, and individuals for comments immediately prior to the public notice date.

All timely letters of comment that address specific analyses in the DEIS were reviewed by the FERC staff. Suggestions for correcting text or data and requests for further discussion of a subject have been given consideration. Those editorial changes and suggestions which were practicable, reasonable, and which improved the quality of the final environmental impact statement (FEIS) are incorporated herein.

Constructive criticism presenting a major environmental point of view or one in opposition to staff's, when persuasively supported, is treated by making revisions in the appropriate part of the FEIS. When the major point of view is not persuasive, reasons are given why the staff did not change its point of view in the space opposite the comment.

The sections of the FEIS that have been modified as a result of comments that raised no questions concerning treatment of subject matter in the environmental impact statement.

The respondents and the page on which their letter occurs are:

RESPONDENT	SYMBOL	PAGE
American Fisheries Society	AFS	F-1
American Rivers, Inc.	AR	F-4
Clallam County Commissioners' Office	CCC	F-9
Conservation Intervenors	CI	F-11
Corps of Engineers, Department of the Army	COE	F-52
Daishowa America Co., Ltd.	DAC	F-63
Dry Creek Water Association, Inc.	DCW	F-87
Department of Energy	DOE	F-94
Department of the Interior	DOI	F-101
Economic Development Council, Clallam County	EDC	F-155
Elwha Klallam Tribe	EKT	F-165
Environmental Protection Agency	EPA	F-209
Friends Insisting on Salmon Habitat	FSH	F-219

COMMENTS OF AMERICAN FISHERIES SOCIETY

American Fisheries Society
NORTH PACIFIC INTERNATIONAL CHAPTER

Weyerhaeuser Company
Technology Center WTC-2H4
Tacoma, WA 98477
Office Tel. (206) 924-6329
FAX (206) 924-6182

April 8, 1991

Honorable Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, D.C. 20426

Ref: Elwha Hydroelectric Project (FERC No. 2683)
Glines Canyon Hydroelectric Project (FERC No. 588)

Dear Secretary Cashell:

The North Pacific International Chapter of the American Fisheries Society represents over 700 professional fishery scientists and administrators in Washington State and British Columbia. At a recent meeting, the Chapter unanimously passed a resolution calling for removal of the two hydroelectric dams on Washington's Elwha River. A copy of this resolution is attached.

AFS-1 Our Chapter respectfully urges the Federal Energy Regulatory Commission to carefully consider the benefits of removing these two dams, which for years have caused losses of important anadromous fishes. The Elwha River drainage is an extensive river system that historically supported very valuable and unique runs of salmon and trout. In particular, the native chinook salmon of the Elwha were reputed to be among the largest in the state, with historical records of fish weighing upwards of 100 pounds. Attempts to mitigate losses of salmon at the dams with hatchery production have met with only limited success. The Endangered Species Committee of the American Fisheries Society recently completed a report that considers both the spring chinook salmon and chum salmon of the Elwha River to presently be nearing extinction, the coho salmon and pink salmon to be at high risk of future extinction, and the sea-run cutthroat trout to be one of the stocks of special concern. Except for the Columbia River, possibly no other river system in Washington State has as many wild stocks of salmon and trout that are in such serious trouble.

RESPONSES TO AMERICAN FISHERIES SOCIETY

AFS-1: Comments in favor of dam removal are noted.

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COMMENTS OF AMERICAN FISHERIES SOCIETY

AFS-1 cont'd

Overall, many naturally reproducing fish populations in Washington are in a state of decline and further losses of locally adapted stocks such as occur in the Elwha River would mean one more nail in the coffin of wild fish production and conservation of our native fish fauna. We believe that the Federal Energy Regulatory Commission has an excellent opportunity to act in behalf of some of the most treasured fishery resources of this region. We therefore strongly recommend that the dams be removed and that due consideration be given to providing fair and equitable alternative energy sources to industrial users of electricity produced by these two dams.

If you have specific technical questions on the fisheries issues, please contact Robert C. Wunderlich at (206) 753-9460, or Brian D. Winter at (206) 526-6172.

Sincerely,

Peter A. Bisson

Peter A. Bisson
President, NPIC-AFS

attachment
cc:

R. McKitrick, Federal Energy Regulatory Commission
O. Campbell, James River II, Inc.
S. Taniguchi, Daishowa America Co., Ltd.
M. Finnerty, Olympic National Park
M. Plenert, U.S. Fish & Wildlife Service
M. Tuttle, National Marine Fisheries Service
P. Paquet, Northwest Power Planning council
J. Blum, Washington Department of Fisheries
C. Smitch, Washington Department of Wildlife
C. Gregoire, Washington Department of Ecology
R. Harder, Point No Point Treaty Council
C. Elofson, Lower Elwha Klallam Tribe
J. Anderson, Northwest Indian Fisheries Commission
J. Baker, Friends of the Earth
Rep. B. Vento
Sen. B. Bradley
T. Jensen, Committee on Energy and Natural Resources
Rep. A. Swift
Sen. S. Gorton
Sen. B. Adams
The Seattle Times
The Seattle Post-Intelligencer
Peninsula Daily News

RESPONSES TO AMERICAN FISHERIES SOCIETY

COMMENTS OF AMERICAN FISHERIES SOCIETY

American Fisheries Society

NORTH PACIFIC INTERNATIONAL CHAPTER

RESOLUTION

WHEREAS, the Elwha River's anadromous fisheries have been critically reduced for approximately 80 years by two hydroelectric dams; and

WHEREAS, prior to hydroelectric development, the Elwha river produced exceptional runs of all five species of Pacific Salmon, including chinook that reached 100 pounds, as well as steelhead, searun cutthroat trout and Dolly Varden; and

WHEREAS, the majority of anadromous fish habitat in the Elwha River remains in pristine condition today because it lies within the confines of Olympic National Park, a United Nations designated World Heritage Site and Biosphere Reserve; and

WHEREAS, full restoration of the Elwha River's anadromous fish resources and ecosystem processes cannot occur with the dams in place owing to numerous adverse impacts, including fish passage losses through the dams and reservoirs; and

WHEREAS, alternative power sources exist for the private industry now receiving all the hydroelectric power from the dams,

LET IT THEREFORE BE RESOLVED THAT the North Pacific International Chapter of the American Fisheries Society supports development of federal legislation and funding that:

1. Results in removal of the Elwha and Glines Canyon Dams and re-establishment of natural river processes in the Elwha River basin.

2. Restores anadromous fish and fisheries throughout their historic range in the Elwha River basin.

3. Provides a means to offset the loss of hydroelectric power to the private industry subsequent to removal of the dams.

RESPONSES TO AMERICAN FISHERIES SOCIETY

DRAFT STAFF REPORT

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Elwha and Glinnes Canyon Projects, Washington	))	Project Nos. P-2683 and P-588

MOTION TO INTERVENE IN OPPOSITION AND
COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT
OF AMERICAN RIVERS, INC.

Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. 385.214, American Rivers, Inc. hereby moves to intervene in the above-captioned proceedings. In addition, American Rivers submits herewith its comments on the Draft Environmental Impact Statement prepared by the Commission in connection with the proposed relicensing of Glinnes Canyon Hydroelectric Project (FERC No. 588) and initial licensing of the Elwha Hydroelectric Project (FERC No. 2683). In support of its motion to intervene, American Rivers states the following:

GROUNDS FOR INTERVENTION

American Rivers is a national non-profit conservation organization headquartered in Washington, D.C. Along with its over 15,000 members across the country (including over 300 members in the State of Washington) American Rivers is dedicated to the preservation and restoration of America's outstanding rivers and their landscapes.

American Rivers is entitled to intervene in this proceeding because it represents individuals who have a direct and personal

interest in the future of the Elwha River. Members of American Rivers would benefit from the restoration of the Elwha River's anadromous fish runs. In addition, American Rivers has extensive experience in hydroelectric licensing and relicensing proceedings. Therefore, the involvement of American Rivers in this proceeding is in the public interest.

STATEMENT OF POSITION

American Rivers strongly opposes issuance of new and original licenses for the Glinnes and Elwha Projects respectively, and strongly supports removal of both dams from the river in order to restore the once abundant anadramous fisheries to the river, and to improve recreational opportunities for fishing and whitewater boating that have been impacted by the dams.

Since their construction, the Elwha and Glinnes Canyon Dams have totally blocked the passage of anadramous fish on Washington's Elwha River. There is significant public interest in restoring the anadramous fish runs of the Elwha. Even if fish passage facilities were installed at the dams, there is little chance that a viable population of anadramous fish could be restored to the river. The relatively small amount of power generated by the two dams (approximately 19 megawatts) is supplied to only one customer, Daishowa America Pulp mill. American Rivers believes that the interests of the public would be far better served by a course of action which gives priority to fish restoration. As indicated in the DEIS, the dam-removal

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option stands a far better chance of restoring anadramous fish to the Elwha than any of the dam-retention options presented by the applicant.

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

AR-1 American Rivers commends the Federal Energy Regulatory Commission for producing a DEIS which accurately evaluates a wide range of complex issues. The Commission has correctly described the outstanding biological, geologic, visual, and recreational resources of the Elwha River, and the trade-offs which would occur if the projects were granted new licenses and permitted to operate into the next century. We believe as well that the Commission has accurately shown that the Daishowa America pulp mill, the sole consumer of the electricity generated by the projects, would not be impacted by a Commission decision to remove the dams. Although the DEIS does not formally endorse a specific licensing action, it presents information which American Rivers believes indicates clearly that the dam-removal option is the most reasonable course of action to pursue.

AR-2 Restoration of Anadromous Fisheries. As the DEIS illustrates, the Elwha River once had one of the most abundant and productive salmon and other anadromous fisheries populations in the Pacific Northwest. The Elwha is widely known for its once thriving populations of Pink, Sockeye, Coho, and every other species of Pacific salmon found in North American waters, as well as large Chinook salmon populations, with some individual fish weighing up to one-hundred pounds.

AR-1: Commendation noted.

AR-2: Comment noted.

4

AR-2 com'd

Construction of the Elwha and Glines Canyon projects in the early part of this century had a devastating effect on wild populations of anadromous fish in the Elwha River. The entire watershed above the first 4.9 miles of the river has been effectively blocked to the passage of fish due to the lack of fish passage facilities at either project. The DEIS shows that removal of either one or both of the dams would significantly aid restoration of the remnant anadromous fisheries of the Elwha by eliminating significant barriers to fish passage. Removal of the dams would also eliminate the impoundments, thus recreating substantial riverine habitat for different fish species. The DEIS has shown well the extent to which each of the different options would contribute to the restoration of anadromous fish to the Elwha.

The DEIS has shown that the there is little chance of restoring the extraordinary fish runs of the Elwha if the Elwha and Glinnes Canyon Dams remain in place. In the event that the two dams remain in place, the DEIS describes the chances of successful restoration of anadramous fish to the Elwha as "poor" for most anadramous fish, and "fair" for the remainder. However, if the dams were removed, the DEIS indicates that there exists a "good" chance for most species of anadramous fish restoration, and an "excellent" chance for two species.

AR-3

Dam Removal. The DEIS shows well the feasibility of safely removing the two dams from the Elwha River. There has been extensive debate over whether the dams could be removed in an

AR-3: The staff notes that the effects of dam removal, particularly in the area of water quality, cannot be adequately mitigated.

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AR-3 cont'd environmentally sound, cost-effective manner. The DEIS shows that if the reservoirs behind the dams are drawn down slowly, and if sediment contained in the reservoirs is stabilized on-site, the impacts to the environment would be short- to medium-termed and could be fully mitigated.

The DEIS has also shown that the dam removal option would not be nearly as expensive as has been asserted by the applicant, James River II. The DEIS presents an estimated cost of $64.3 million, while the applicant has reported estimates nearly ten times that amount.

AR-4 Cost of Electricity. As the DEIS indicates, the cost for power to the Daishowa America Pulp Mill (the sole consumer of power generated by the Glinnes Canyon and Elwha dams) is likely to be about the same under both the dam retention and dam removal options, providing the costs associated with dam removal are not assumed by the mill.

CONCLUSION

For reasons specified above, American Rivers respectfully requests that the Commission (1) grant this motion to intervene, (2) deny licenses for both the Glinnes Canyon and Elwha Dams, (3) provide for removal of both dams from the Elwha River.

Respectfully Submitted,

Matth H. Huntington

Matthew H. Huntington
American Rivers, Inc.
801 Pennsylvania Ave, S.E.
Washington, D.C. 20003

AR-4: The referenced analysis has been extended to a 30-year period based on BPA power cost projections.

COMMENTS OF CLALLAM CO. COMMISSIONERS' OFFICE

CLALLAM COUNTY
COMMISSIONERS' OFFICE

COURTHOUSE
223 EAST FOURTH STREET
PORT ANGELES, WASHINGTON 98362-3098

(206) 452-7831, EXT. 233
SCAN 575-1234

JIM RUMPELTES, ADMINISTRATOR

BOARD OF COUNTY COMMISSIONERS

DAVE CAMERON, DISTRICT I
DOROTHY DUNCAN, DISTRICT II
LAWRENCE GAYDESKI, DISTRICT III

June 27, 1991

Mr. S. Ronald McKitrick
Federal Energy Regulatory Commission
825 N. Capitol Street NE
Washington, D.C. 20426

Dear Mr. McKitrick:

The Clallam County Commissioners are concerned about the proposed removal of the Elwha Dams.

CCC-1 The combined assessed value of the two structures is $19,199,650, a significant property tax generator for local government. With declining timber tax and timber harvest revenues, local government can ill afford to take this financial hit as well. The economic impacts to the residents of Clallam County would be significant. The loss in taxes paid to Clallam County for use of the dams is over $250,000 each year. By comparison, the National Park Service in 1990 paid only $54,854 to Clallam County in payments in lieu of property taxes.

CCC-2 While limited, the two structures provide a cheap, hard-to-replace, clean source of electrical energy. With the uncertainty on the Snake and Columbia river systems the Pacific Northwest cannot risk the loss of even 20 megawatts of hydroelectric power. About two-thirds of the estimated $254 million cost of removing both dams is the value of energy foregone, which would have to be borne by the region as a whole at a time when the Puget Sound area is experiencing mounting problems with voltage reliability and energy consumption is beginning to exceed regional energy supplies.

CCC-3 One of the most important issues, impossible to estimate, is the cost to the taxpaying public. Estimates are impossible to make not only for removal, but for the long term mitigation of habitat restoration. Who pays? There is no guarantee monies will always be available to accomplish these tasks.

RESPONSES TO CLALLAM CO. COMMISSIONERS' OFFICE

CCC-1: Comment noted. Tax payments to the county under each alternative have been revised in the FEIS based on new information. The FEIS also notes that tax payments could be wholly or partially replaced by state or federal in-lieu tax payments if such an agreement is made.

CCC-2: Concerns about dam removal are noted.

CCC-3: Comment noted.

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COMMENTS OF CLALLAM CO. COMMISSIONERS' OFFICE

Mr. S. Ronald McKitrick June 27, 1991 2

CCC-4 The loss of wetlands and wildlife habitat have been overlooked. Lake Mills and Lake Aldwell provide a combined total habitat area of 683 acres and 8.1 miles of shoreline, much more than the 5.4 miles of shoreline left with dam removal, and not nearly as desirable.

CCC-5 The best salmon runs were experienced in the 1940's, 50's, 60's, long after the installation of the dams in 1912 and 1927. State and federal fisheries management decisions have caused the fish decline, not just the dams. There are no guarantees that fish restoration projects would be successful. Experimenting on undammed rivers seems more logical. Fish runs have also declined in all other Olympic Peninsula rivers, none of which have hydroelectric dams.

CCC-6 Relative to water quality, the technical uncertainties of dam removal could lead to more disruptive and costly options, especially rock conditions in the bottom of the reservoirs needed for construction of the diversion tunnels and the stability of the silt component of the reservoir sediments. High silt loads would reduce or eliminate production of fish stocks presently in the middle and lower river and adversely affect water supplies to residential, commercial and industrial users as well as to fish rearing channels. Costs are unknown to allow continued use of the Elwha River water as a source during the 10 year restoration period.

CCC-7 Loss of clean, consistent water supply to Daishowa, ITT Rayonier, along with the loss of the electrical power, coupled with the reduction of raw materials available for pulp production make it increasingly difficult for Port Angeles' two major employers to continue viable operations.

CCC-8 Who will pay for the replacement of Port Angeles' water collection system? The estimated replacement cost of $11 million, once again placed on local taxpayers already suffering from depressed timber economy.

Whatever the decision might be, one would hope that a win-win solution would be selected. For the reasons given above, it appears that with dam removal a lose-lose situation could exist. The Clallam County Board of Commissioners asks that extreme care and caution be exercised in determining the fate of the Elwha River and Clallam County.

Sincerely,

BOARD OF CLALLAM COUNTY COMMISSIONERS

Dorothy Duncan

Dorothy Duncan, Chair

RESPONSES TO CLALLAM CO. COMMISSIONERS' OFFICE

CCC-4: The reservoirs support significantly fewer species than the equivalent amount of terrestrial habitats (see Section 3.5.2). Currently, the shoreline around Lake Aldwell provides habitat for furbearers but water fluctuations at Lake Mills result in relatively low use of shoreline habitats by these species (see Section 3.5.2). Loss of the lacustrine habitat provided by the reservoirs would primarily affect waterfowl, although the river and wetlands would provide some habitat for these species (see Section 4.2.4.2). Dam removal would result in the temporary loss of wetlands, but the staff expects these to be replaced along the new river channel (see Section 4.2.4.1).

CCC-5: Comment noted.

CCC-6: Comments noted. Section 4.2.2.2 has been revised to more adequately describe impacts of dam removal to residential and industrial users of water. Cost-effective measures are proposed and described in Section 4.2.2.3 to minimize impacts of adverse water quality conditions on water users.

CCC-7: Comment noted. In the FEIS, the cost of maintaining the quality of the industrial water supply to Daishowa, ITT, and others has been added as a mitigation cost to the dam removal alternatives.

CCC-8: Staff's estimate of the cost of maintaining the Port Angeles water supply system (both municipal and industrial) is much lower than $11 million (Appendix A, Table A-27). However, this cost is now included as part of the dam removal mitigation package, and would be borne by the entity charged with removing the dams.

COMMENTS OF CONSERVATION INTERVENORS

RESPONSES TO CONSERVATION INTERVENORS

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

James River, II. Inc.	)	**Project No. 588**
James River II, Inc.	)	**Project No. 2683**

COMMENTS BY CONSERVATION INTERVENORS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

Ronald Wilson
Sierra Club Legal Defense Fund
1531 P Street, NW
Washington, DC 20005
202/667-4500

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Attorney for Friends of the Earth, Olympic Park Associates, Seattle Audubon Society, and Sierra Club

James Baker
Friends of the Earth
4512 University Way, NE
Seattle, WA 98105

Dr. Richard Rutz
Seattle Audubon Society
8028 35th, NE
Seattle, WA 98115

June 27, 1991

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COMMENTS BY CONSERVATION INTERVENORS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

The following comments on the draft Environmental Impact Statement (DEIS) for the Glines Canyon and Elwha hydroelectric projects are submitted to the Federal Energy Regulatory Commission by the following environmental organizations (hereafter "Conservation Intervenors"):

Friends of the Earth
Olympic Park Associates
Seattle Audubon Society
Sierra Club
Trout Unlimited

Friends of the Elwha
Long Live the Kings
The Mountaineers
Northwest Rivers Council
National Parks and Conservation Association
Olympic Rivers Council
Washington Wilderness Coalition
National Wildlife Federation
Washington Wildlife Federation
Northwest Conservation Act Coalition

The first five groups have previously intervened in the current re-licensing proceeding before the Commission. The remaining organizations are today filing a motion to intervene in the proceeding pursuant to 18 C.F.R. §380.10.

These comments are divided into four parts: (I) general introductory remarks; (II) an analysis of electric power issues; (III) a review of the text of the DEIS; and (IV) because the section contains a number of inaccuracies and misrepresents the rest of the DEIS, a specific critique of Section 5.0

I. GENERAL INTRODUCTION

Development and Consideration of Information

The development and reporting of information in this DEIS has generally been consistent with the need to objectively acquire and consider relevant information. The quality of the DEIS is markedly higher than has been the case in other FERC EIS's that we have seen. There are, however, some significant exceptions to this observation, particularly with regard to the absence of consideration of the cumulative impacts to the environment and the poor environmental and safety record of the projects.

COMMENTS OF CONSERVATION INTERVENORS

There are also surprising omissions in the evaluation of the alternatives under consideration, such as evaluation of conventional screening at both powerhouses and consideration of more spill levels. There is good consideration of some mitigation measures and programs, but insufficient discussion of mitigative measures for such important concerns as the restoration of gravel movement and large organic debris movement. Resource discussions of recreational and cultural resources are abbreviated and do not provide the full information that is expected for an EIS for a major project. Archaeological surveys are not complete. The impacts to the World Heritage Site are not properly addressed as required by law (see comments regarding page 3-71 below). Recreational data are incomplete.

Effect of No Action

No action is no licensing. Without action by the Commission to license the projects, both projects would have to be removed. and the environment restored.

CI-1 This point has two important consequences in this DEIS: First, there is no vested right or entitlement to power generation or revenues derived from such generation. All discussions of "power generation foregone" or "foregone power revenues" are thereby inaccurate, and attribution of such specious costs to the dam removal alternative are improper. All discussions of foregone revenues and costs attributed to them should be deleted from the DEIS. Secondly, the cumulative impacts of the dams, past, ongoing, and future need to be considered (see below)

Cumulative Impacts and Baseline

Perhaps the most serious omission in the DEIS is the lack of consideration of the cumulative and unmitigated environmental damage and harm caused by the two projects, and the considerable benefits realized by the Applicant for over 70 years from the externalization of costs to the environment. From the time of our original intervention we have stressed the need for recognizing, evaluating, and addressing these impacts. We have

CI-2 yet to see this issue addressed. Implicit in this DEIS is the consideration of current conditions as a "baseline" from which all impacts or considerations are compared. This is a major flaw in the analysis.

The decision whether to license or relicense dams is a commitment of resources. There is no vested right to a license; in the absence of a decision to confer a license the projects would have to be removed and the environment be restored (see Effect of No Action above). The baseline is the natural environment that would result from no action, not the current conditions.

2

RESPONSES TO CONSERVATION INTERVENORS

CI-1: The staff agrees that under the Federal Power Act there is no vested right or entitlement to power generation at the termination of a license or in the case of an unlicensed project. Nonetheless, the two projects together produce about 170 GWh of electrical energy annually. Each of the alternatives would affect the current level of generation. Therefore, the change in generation is an impact which must be described.

CI-2: In considering the licensing of existing projects, it is FERC policy to use current conditions as the baseline from which to compare alternatives. The staff's focus is not on what could have been if the projects were never constructed, but rather on how the future can be improved given present-day realities.

The EIS describes the historical environmental harm that has occurred (Section 3.0), but it does so for the purpose of placing the anadromous fish and ecosystem restoration objectives into context and establishing their importance. Historical damage has no other relevance to the Commission's decision.

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STAFF REPORT

CI-2 cont'd Cumulative past, present, and future impacts must be evaluated, considered in decision-making, and costs of correction, mitigation, and restitution be allocated to the Licensee as part of any dam retention alternative. The DEIS has failed to do this.

Economic Analysis

CI-3 Costs for the dam retention alternative should include not only measures in the Applicant's proposal but also staff- and JFWA-recommended measures. Costs of power foregone may not be attributed to the dam removal alternative, since there is no vested right to revenues from power generation. (The calculations for these "costs" are, moreover, highly inaccurate.)

Preliminary Findings

CI-4 We are concerned that the objective consideration and analysis of information in the body of the DEIS does not appear to have been carried through to the conclusions or findings. Section 5 differs considerably in its representation of information set forth in the earlier sections, and is also in conflict with some of the statements in the Executive Summary. Section 5.6., the preliminary findings, in particular exhibits an unbalanced approach. There is a decided lack of parallelism in the treatment of the alternatives and in the findings of their impacts and costs. The DEIS would be greatly improved by the complete revision of Section 5, and especially Section 5.6., to provide for an objective evaluation of the alternatives.

Balancing of the Public Interest

CI-5 There have been massive impacts to the environment in the past and the present. The owners have derived substantial revenues and several-times-over amortization of the projects, and there would be large and real environmental impacts that would continue if the projects were retained. The impacts of the past and present to tribal treaty rights and cultural values would continue if the dams were retained, as would the impacts to the national park, international biosphere reserve, and world heritage site.

Given the magnitude of past and present impacts, the magnitude of future impacts if the dams were retained, and the feasibility of removal of the dams and of restoration of the environment, the Commission must seriously consider whether the public interest would best be served by a decision to continue these impacts and damages in return for, at best, 20 MW of capacity.

Need for Power; Replacement Power

CI-6 The Commission is required to consider reasonable availability

CI-3: The costs of staff-recommended measures have been included in the applicant's proposal with supplemental measures. Replacement of power foregone has a cost that will have to be borne by the region. The staff has no doubt that cost of power foregone is a completely appropriate and necessary cost factor.

CI-4: Section 5.6 has been revised.

CI-5: Comment noted.

CI-6: All relevant filings have been considered in preparation of the EIS.

CI-6 cont'd and costs of alternative sources of power. Substantial information has been submitted by us to the Commission regarding these issues. We see relatively little evidence that the specifics supplied by us have been considered in the preparation of this DEIS.

II. ELECTRIC POWER

At the outset, we would note that the Electric Consumers Protection Act of 1986 and FERC's own regulations require that Commission licensing decisions be consistent with the Northwest Regional Power Plan promulgated by the Northwest Planning Council.

Long-Term Marginal Resource Comparison

CI-7 The entire analysis of cost of electric power in the DEIS hinges on the "Long-Term Marginal Resource Comparison" in Section 2.7.2 (pages 2-29 - 2-34). The DEIS states, "The economic benefits (or costs) of the proposed and alternative actions associated with the Elwha and Glines Canyon projects were estimated through comparative evaluation with the cost of providing a comparable amount of power by means of the region's long-term marginal generating resource (coal-fired powerplant) as defined by the [Northwest Power Planning] Council" (page 2-31). This comparison suffers from a number of inaccuracies, both factual and conceptual.

First, the Council has recently adopted a 1991 Power Plan for the region. In this new Plan, the Council no longer uses a coal-fired power plant as the "marginal resource." Instead, the Council has placed, as the resource at the top of its most extreme portfolios, a combustion turbine fired either by natural gas (if available) or gasified coal. This choice dramatically reduces the environmental impacts of any future coal-fired generation.

In any case, the Council does not compare a particular resource (such as these Elwha River dams) against the resource at the top of its most extreme portfolios. Instead, the Council employs an avoided cost methodology (1991 Power Plan, Volume 1, page 32) in its Action Plan for resource acquisitions. The Council sets the regional avoided cost for generating resources at 7.5 cents per kilowatt-hour, and the cost-effectiveness limit on conservation resources at 11 cents per kilowatt-hour.

By contrast, the DEIS uses the following as a benchmark cost for comparison purposes: "The 50-year levelized cost of equivalent coal-fired generation is about 96 mills/kWh in 1996 dollars" (page 2-32). Obviously this figure is much higher than the Council's avoided cost amount. Moreover, the FERC staff should convert the Council's figure of 7.5 cents per kilowatt-hour to

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CI-7: The staff has adopted the Council's avoided cost methodology as the basis for valuing replacement power. The gasified coal plant cost is included as a sensitivity test (Appendix E).

The staff is unaware of any estimates of dollar value for the principal nondevelopmental values, specifically restoration of Elwha River anadromous fish runs or Olympic National Park ecosystem restoration. Decision makers will always be required to balance among quantitative and qualitative factors. The staff sees little to be gained and substantial controversy to be invited by attempting to assign dollar values to these objectives in the absence of survey data specific to the Elwha River. The EIS includes dollar estimates of fish harvest under each of the alternatives (Section 4.0).

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CI-7 cont'd

reflect (a) 1996 dollars, (b) dollars levelized over 50 years, and (c) the non-firm characteristics of the dams' output. Following this conversion, the benchmark cost or value of electric power should fall lower than the 9.6 cents per kilowatt-hour used in the DEIS. The final document should scrap the marginal resource methodology, and adopt the Council's avoided cost methodology.

Second, the calculation in the DEIS ignores external costs of electric power production, especially environmental ones. As the Conservation Intervenors pointed out in filings with the Commission in May, 1990 and January, 1991, Congress has directed the Northwest Power Planning Council in the Northwest Power Planning Act of 1980, and the FERC itself in the Electric Consumers Protection Act of 1986, to incorporate ALL costs, including environmental ones, into estimates of power costs.

However, the DEIS argues: "Because of the absence of generally accepted methodologies, no attempt was made to assign dollar estimates to non-developmental values such as fish production, recreational use, terrestrial resources, or aesthetics" (page 2-29). This is patently untrue. It is difficult to reach a consensus on how to assign dollar amounts to the FULL value of fish production or a restored national park. But numerous methodologies exist for dollar estimates of the MINIMUM value of these resources. As required by law, the final EIS should incorporate at least minimum estimates of external costs into its calculations of cost of power.

Value to the Region of Power from the Elwha River Dams

CI-8

Due to the inaccuracies in establishing a benchmark for cost comparisons, the analysis in the DEIS vastly overestimates the value of any foregone electric power from the dams. The DEIS further distorts the dams' value to the Pacific Northwest Region.

The marginal resources methodology in the DEIS and Section 1.4.3.2 "Environmental Effects of Fossil Fuel Use" take the view that a coal-fired resource would sooner or later replace the Elwha River dams, if removed. For example, the DEIS states, "Given the present and potential future role of coal-fired generation in the Pacific Northwest, hydroelectric generation provides an opportunity to reduce the quantity of atmospheric pollutants associated with the combustion of fossil fuels" (page 1-11). Even a cursory review of any past, much less the present, Power Plan for the region would lead to very different conclusions.

The 1991 Plan forecasts that the region would not acquire any coal gasification resources under the medium-low load growth scenario, and would not begin such acquisitions until the year

CI-8: The EIS has been clarified to indicate that the power currently supplied by Elwha and Glines Canyon would be replaced by adjustment in timing or quantity of any of the conservation and generating resources contained in the Council's portfolio.

Section 4.5.1.7 has been modified to more accurately portray potential adverse effects of conservation.

The Daishowa Mill Recycled Paper Project has been incorporated in the analysis. Its existence is credited with 61 GWh annual reduction in overall mill electrical energy requirements (reference Section 2.7.3).

Other comments are noted.

2002 under the medium-high scenario. Indeed the 1991 Power Plan predicts that the region would not build any coal gasification facility until demand had grown more than 12,000 average megawatts over current consumption! See 1991 Power Plan, Volume I, page 15.

In the DEIS, Figure 1-1 "Regional Load/Resource Balance" (page 1-10) indicates that the region would not experience deficits until the year 1994 under medium-high growth, and the year 2003 under medium-low. As shown in Table 2-10 "Resource Availability for the Resource Portfolio" (page 2-27), the region has a number of options other than coal-fired generation by which deficits can be met, or dams replaced. In the 1991 Power Plan, the Council identifies conservation, renewables, and hydrofirming as the resources of choice before coal gasification.

CI-8 cont'd

Section 4.5.1 "Regional Impacts" (pages 4-193 - 4-195) and Part 8 of Appendix A (pages A-107 - A-113), in which the DEIS reviews various power replacement resources, seems to recognize the fact that the region has numerous options for replacement power supply. The final EIS should strike any implied or overt references to coal-fired resources as replacement for the Elwha River dams.

In Section 4.5.1, the DEIS correctly notes, "Generally, conservation resources would have no adverse environmental consequences" (page 4-193). The text mistakenly adds, "One exception is residential weatherization programs where substantial space heating savings can be obtained at the expense of decreased ventilation" (page 4-193). In its Model Conservation Standards for residential weatherization, the Northwest Power Planning Council has incorporated provision for mechanical ventilation which eliminates this potential shortcoming.

Since conservation carries no long-term environmental impacts, and since the dams kill fish as documented in the DEIS, the region should clearly prefer conservation over the Elwha River dams. Indeed the Conservation Intervenors in their January, 1991 filing with the Commission demonstrated the potential to capture 15-20 megawatts of cost-effective conservation resource at the Daishowa America Port Angeles Mill. It is important to point out that the bulk of these potential savings (12-15 megawatts), which derive from substitution of recycled pulp for virgin wood chip stock, are NOT represented in the Power Planning Council's supply curves for cost-effective conservation. Moreover, as we stated earlier, the Council in the regional Power Plan has set the cost-effectiveness limit on conservation resources at 11 cents per kilowatt-hour -- a clear indication that the Council and the Plan view this potential conservation resource as very valuable indeed.

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CI-8 cont'd The DEIS concludes, "Eliminating the Glines Canyon and Elwha projects. . .would decrease the region's resource base to a small extent and increase projected deficits" (page 1-11). Because substitution of recycled pulp does not appear in the Council's conservation supply curves, replacement of the dams through this resource might very well result in no net change in load/resource balance for the region. In any case, the dams at an average 19.6 megawatts represent just over 0.1 percent of actual loads in 1987 (DEIS, page 1-9), and will become an even smaller portion of regional power supply in future years. As for acceleration of projected deficits, the 1991 Power Plan calls for the immediate acquisition of 1500 megawatts of efficiencies and predicts the capture of 4200 megawatts of conservation and renewables in the unlikely event of medium-high load growth. The generation from the Elwha River dams pales in comparison to these regional needs. The final EIS should state numerically how small the contribution of the Elwha River dams is to current regional power supply and future needs.

In short, the Elwha River dams offer the Pacific Northwest a tiny amount of power supply which the region can and would replace with cost-effective conservation. This conclusion is all the more justified when the region faces a crisis of severely depleted salmon runs. Again, the DEIS correctly concludes that the best prospects for fish restoration come with dam removal. The Conservation Intervenors maintain that the region places a much higher value on the Elwha River fish than the dams' generation. ECPA requires the FERC to take the same view.

If the FERC staff had employed a reasonable cost comparison methodology and had accurately portrayed the value of the dams' generation to the region, the Conservation Intervenors are confident that removal of the dams would show a marginal cost or even a net benefit to the region. The Conservation Intervenors are in receipt from the Lower Elwha Klallam Tribe of an analysis which, in fact, demonstrates a net benefit to the region from dam removal. We recommend the Tribe's analysis to the Commission for incorporation into the final EIS.

Forecast of Power Costs for the Daishowa America Mill

CI-9 All the shortcomings that we have so far identified in the DEIS analysis of power costs apply to, and distort, the discussion of power costs for the mill in Section 2.7.3 "Assessment of Daishowa America Mill Power Cost Impacts" (pages 2-35 - 2-43). For example, if the cost estimates incorporated at least minimum external costs for fish production and a restored national park, the cost of power from the Bonneville Power Administration (BPA) under the dam removal alternatives would become significantly lower than the generation from the dams.

With correction of these deficiencies and others discussed below,

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RESPONSES TO CONSERVATION INTERVENORS

CI-9: The projected BPA rates have been updated to reflect recent BPA forecasts and extended to 30 years on the basis of BPA guidance (Section 2.7.3).

The 168 GWh figure is based on the long-term average, which better reflects the project's power production potential.

The cost of power analysis (Table 2-20) has been modified to reflect both present value and levelized cost.

The staff has revised the initial O&M cost estimate by removing extraordinary items in recent years that should be considered "repair and replacement" rather than routine O&M. Repair and replacement costs are estimated separately. Routine O&M should not increase faster than inflation.

The cost of staff-recommended measures has been explicitly accounted for in the applicant's proposal with supplemental measures (Section 2.2.5).

The 1991 Daishowa Mill energy audit conducted for the City of Port Angeles Light Department under the sponsorship of BPA identified 9.6 GWh of potential annual energy conservation savings. This estimate is far below the Conservation Intervenors' claim of 15 to 20 average megawatts (i.e., 131 to 175 GWh).

The suggestion to use the same cost of power reference case in all three mill demand scenarios lacks justification. Using a single reference case would cloud the issue. The reader would be unable to distinguish between two simultaneous effects: (1) the effect of demand level changes on power costs, and (2) the effect of Elwha/Glines Canyon alternatives on power costs. The analysis, as presented, isolates the effect of the Elwha/Glines Canyon alternatives, which is the function of the EIS. A reader is welcome, nonetheless, to use the EIS data to assess the low demand and high demand power cost projections in relation to the base reference case if that is deemed useful.

the final EIS should forecast much higher costs from the dams than from BPA deliveries. The Conservation Intervenors find the projection of BPA rates quite accurate and plausible, and urge the Commission to reject any arguments for increasing these figures. In REAL (1990) dollars, BPA predicts that its Priority Firm rate will actually decrease over the next 20 years. And indeed in its last three biennial rate cases, BPA has held any increases well under the wholesale inflation rate. Speculation that salmon recovery in the Columbia River basin or new resource acquisitions will drive substantial rate increases in the future is just that -- speculation. The agency has offered its assessment of what the future holds for BPA Priority Firm rates, and the FERC should defer to BPA's professional judgment.

But the analysis of cost of power from the dams is implausibly optimistic. First, table 2-11 "Daishowa America Mill Power Requirements and Project Utilization" (page 2-30) shows that the dams have produced an average of 161 gigawatt hours over the last 8 years, and just 150 over the last 5. Nonetheless, the DEIS assumes 168 gigawatt hours as average annual energy in Table 2-14 "Energy Output and Cost Summary" (page 2-34) and elsewhere in the document. The higher figure exaggerates the benefits of dam retention.

CI-9 cont'd

Second, the analysis yields a weighted average cost rather than a present value. In establishing a benchmark for power replacement costs, the DEIS relied upon present value; it should do the same here. In present value, power under dam retention would cost 38 mills per kilowatt-hour, and under dam removal, 37.7 mills per kilowatt-hour.

Third, the FERC staff continues to underestimate future operation and maintenance (O&M) costs. In Appendix A (pages A-74 - A-75), the DEIS acknowledges that O&M costs have escalated dramatically in recent years. The discussion, however, offers no specific reason why "future cost increases are anticipated by the staff to reflect the general trend in the underlying inflation rate" (page A-75). Lacking a specific explanation to the contrary, the staff should assume that O&M will increase on the recent upward straight-line, and will not level off.

Fourth, the forecast of power costs from the dams incorporates solely the measures in the applicant's retention proposal. Already in the DEIS, the FERC staff has recommended improvements in the fish ladder at Elwha Dam as well as tests of the Elwha project eicher screen and Glines Canyon flow regime. Since it is reasonable to expect the Commission to require additional mitigation measures, the forecast of the dams' power costs should reflect mitigation costs over and above the applicant's proposal. Based upon the discussion in Section 4.1.3.3 "Staff-Recommended Measures" (pages 4-34 - 4-38) and Appendix A (page A-76) in the DEIS, the Conservation Intervenors have identified and calculated

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the following additional mitigation costs:

Improvement in Elwha fish ladder

Energy Loss (megawatt-hours) = 1,167
Capital Cost (million $) = 1.3
Energy Cost (million $) = 1.1
Total Cost (million $) = 2.4

Elwha conventional fish screens

Energy Loss (megawatt-hours) = 1,068
Capital Cost (million $) = 7.5
Energy Cost (million $) = 1.0
Total Cost (million $) = 8.5

Flow regime at Glines Canyon

Energy Loss (megawatt-hours) = not stated
Capital Cost (million $) = 0
Energy Cost (million $) = 4.3
Total Cost (million $) = 4.3

CI-9 cont'd

Fish ladder at Glines Canyon

Energy Loss (megawatt-hours) = 2,199
Capital Cost (million $) = 3.9
Energy Cost (million $) = 2.1
Total Cost (million $) = 6.0

Spill of 450 cfs at Glines Canyon

Energy Loss (megawatt-hours) = 2,250
Capital Cost (million $) = 0
Energy Cost (million $) = 2.1
Total Cost (million $) = 2.1

Eicher screen at Glines Canyon

Energy Loss (megawatt-hours) = 2,726
Capital Cost (million $) = 14.6
Energy Cost (million $) = 2.6
Total Cost (million $) = 17.2

Addition of any one of the above additional mitigation measures would dramatically increase cost of power from the projects. Moreover, the JFWA has recommended additional mitigation measures that should add significant costs to power from the dams.

Conservation at the Mill

Because the assessment of cost of BPA power is basically sound,

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and because good reasons exist to expect the dams' costs to escalate much faster than predicted in the DEIS, an accurate forecast would demonstrate that the dams have flunked the test of the marketplace. As a result, Daishowa America should, at the minimum, investigate other power supply resources than the dams. Under the law, so should the FERC.

In our January, 1991 filing with the Commission, the Conservation Intervenors identified opportunities to capture 15-20 megawatts of cost-effective conservation at the Daishowa America mill, which qualify for BPA funding. In the filing, we further argued that, while it is physically possible to install conservation and retain the dams, the company can and should view energy efficiencies measures as replacement power. The Northwest Power Planning Act and the Electric Consumers Protection Act require the FERC to take this perspective on conservation.

Thus it is inappropriate in Table 2-18 "Forecasted Cost of Power to Daishowa America Mill" (pages 2-41 - 2-43) to develop a different figure for the reference case in the scenario for mill expansion, and especially in the scenario for conservation savings. The reference case should merely provide, for comparison purposes, an estimate of power costs if there were no change. The reference case under the "current use" scenario provides this base case function. The DEIS should compare against this number the impact dam retention or removal would have, and how expansion of, or conservation in, the mill would alter the company's competitive position.

CI-9 cont'd

Stating this another way, action by the Commission in this proceeding must and will come. The mill may or may not expand or capture new efficiencies. Therefore, the DEIS compares dam removal and dam retention in three future scenarios -- current use (which should more accurately be named "current load"), mill expansion, and conservation savings -- not only to determine the business impacts of dam removal or retention, but also to assess how much conservation in the mill would serve to replace the value of power from the dams. In order to provide this more valid and useful comparison, the final EIS should develop one "no change" reference case for the power forecast, and then compare the various mill operations scenarios against that one fixed point of reference.

In the final document, the conservation scenario should continue to assume that conservation in the mill would be funded by BPA (page 2-38). In our January, 1991 filing, the Conservation Intervenors submitted a letter from the BPA Administrator to Rep. Al Swift in which the agency identified three on-line programs for funding efficiency measures: billing credits, competitive bidding, and the Energy Savings Program. The DEIS only refers to the last of the three. With so many different funding mechanisms

CI-9 cont'd

available, it seems safe to assume that, if a measure is cost-effective as defined by the regional Power Plan, BPA should fund the conservation installation.

By modifying the reference case in each new scenario for mill operations, the DEIS repeatedly emphasizes that conservation (or mill expansion) can proceed whether the dams stay or go. This is not useful. However, comparing the different future scenarios against one reference base case would allow the analysis to answer a much more important question--that is how much conservation (or some other resource such as co-generation) funded by BPA is needed to maintain the mill's current competitive advantage? In other words, how much conservation (or some other power supply) constitutes replacement power? The Conservation Intervenors argue that, if the forecast of power costs were improved in the ways outlined above, the analysis would show that the conservation resource identified in our January, 1991 filing would provide a greater competitive advantage than would the dams' output.

Other Issues Related to Electric Power

On pages 2-28 and 2-29, the DEIS discusses the relationship between the two companies, James River II and Daishowa America. Other than a 1990 filing by James River, the staff has no documentation of this or any other possible relationship between the two corporations. Only a copy of the contract between the two companies can provide full proof of the exact relationship between them. Therefor, the Commission should require production of the contract. Until the FERC has received and inspected a copy of the contract, the EIS should make no representation whatsoever about the relationship between the two companies.

CI-10

The footnote to Table 2-13 "Cost Categories Included in the Economic Analyses" and Section 4.5.2 "Impacts on the Port Angeles Power Supply System" suggests that dam removal would affect voltage support and transmission capability in the Port Angeles area. A new analysis by BPA indicates that removal of the Elwha River dams would equal approximately one year of current load growth in the area. Under current predictions for load growth in the Port Angeles area, BPA does not anticipate any need for transmission upgrades -- to serve loads or for voltage support -- during the next ten years. The DEIS does accurately portray the need to install capacitors (and their related costs) in order to maintain acceptable power factors if the dams are removed.

Finally, the entire analysis of the economics of electric power in the DEIS is confusing and probably distorted because values are alternately stated in 1990 dollars or in 1996 dollars. There is a 30 percent difference between these two values. For convenience if not for accuracy, the final EIS should choose one

CI-10: In characterizing the relationship between James River II and Daishowa, the staff relied upon an applicant filing, the accuracy of which the staff has no reason to doubt.

Because of the uncertainty regarding transmission upgrade timing, the staff did not include transmission upgrade costs in its analysis.

The reference date for all cost estimates is 1990. The economic and cost of power analyses use 1996 as the base date of the analysis in keeping with standard project evaluation methods.

CI-10 cont'd value and only one value for money, and use that value throughout the entire document.

III. SPECIFIC COMMENTS ON THE DEIS

Executive Summary, Page xxxiii.

CI-11 The Olympic National Park is an International Biosphere Reserve and a World Heritage Site.

Executive Summary, Page xxxiv.

CI-12 The primary environmental attributes of the Elwha drainage are both the historic runs of anadromous fish, and the fact that it is the largest drainage in the Olympic National Park and thus a key to the health and well-being of the environment within this national park.

Executive Summary, Page xxxiv.

CI-13 The text is not consistent with Table 4-4, which rates winter steelhead prospects as "good". The JFWA have rated these prospects as only "fair" (see comment for Table 5-3).

Executive Summary, Page xxxv.

CI-14 The Applicant's proposal would do little for the restoration of natural conditions in Olympic National Park. JFWA biologists rate restoration prospects for the stocks in question as being fair at best. Nothing would be done to restore the natural river environment. (This is a more succinct statement than "would preclude reestablishment of natural conditions.")

Executive Summary, Page xxxvi.

CI-15 Parallel discussion of impacts is a necessary feature of an EIS. If the impacts of sediment load are to be characterized as "relatively severe" for dam removal, a parallel discussion of dam retention would discuss the many severe accumulated and ongoing environmental impacts of the dam retention alternative. Currently, there is no such parallel discussion of impacts.

Executive Summary, Page xxxviii

CI-16 Our comments speak to the inaccuracy of styling the energy costs of the dam removal alternative as severe, and also to the higher

CI-11: The Executive Summary has been changed as indicated.

CI-12: The Executive Summary has been modified to indicate that historical runs of anadromous fish are one of the primary attributes of the Elwha drainage.

CI-13: The text has been changed in the Executive Summary.

CI-14: Based on the staff's evaluation, there is a fair chance that the applicant's proposal would restore coho runs to the Elwha River and a good chance that chinook runs would be restored. The staff believes that a fair-to-good chance of restoring two runs of anadromous fish to the middle and upper reaches of the Elwha drainage represents an improvement over existing conditions. The fact that the applicant's proposal would not restore the Glines Canyon Project area or the natural river hydrology and aquatic biology within ONP has been added to the Executive Summary.

CI-15: Parallelism cannot be achieved in every section and subsection. Within the context of the full EIS, all alternatives are treated in a parallel fashion.

CI-16: The Executive Summary has been revised.

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CI-16 cont'd costs of the dam retention alternative than are represented in the DEIS. Upon correcting the relevant DEIS sections, the Executive Summary should be corrected to reflect the comments and changes.

Executive Summary

CI-17 Missing from the Executive Summary is any representation of effects of the different alternatives in meeting tribal treaty rights.

Section 1.1, Page 1-1.

CI-18 At issue in this EIS and in these proceedings is the public's interest in the Elwha River and its resources, and the responsibility to uphold the treaty rights of the Lower Elwha Klallam Tribe. The purpose of the EIS is to consider and evaluate the past impacts and probable consequences to the environment of Commission action, and to assist the Commission in making its decisions and determinations. The DEIS needs to better recognize these purposes and issues. In Section 1.1, it fails to speak to them; in others, particularly in Section 5.0., it badly misstates them. Sections 1.1 and 5.0 should be revised to incorporate the above.

Section 1.2.1.2, Page 1-2

CI-19 The recounting of the chronology of the motions needs augmentation. In our original 1984 motion to intervene, the Conservation Intervenors petitioned the Commission to find that it had no authority to license and relicense hydroelectric projects in national parks. We further petitioned the Commission to order the removal of the Glines Canyon Dam. We have subsequently made several additional filings to augment the record, one of which is the referenced March 1988 filing. Finally, the Department of Interior, the Tribes, and the Conservation Intervenors have now petitioned for review of the Commission's decision in the Ninth Circuit.

Sections 1.2.2, 1.2.2.1, and 1.2.2.2, Page 1-3.

CI-20 It has been 23 years since the license application for Elwha Project was filed, and 13 years since the decision of the Administrative Law Judge. The Federal Power Act prohibits the operation of nonfederal hydroelectric projects without a license. The Elwha Project has no such license, and has been operating illegally for 13-23 years, depending on how it is reckoned. This operation without a valid license should be stated and acknowledged in these sections.

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CI-17: The relative consistency of the alternatives with tribal treaty rights cannot be determined on the basis of the technical studies prepared for the EIS and for this reason is not included in the Executive Summary of the EIS. The 1855 Treaty of Point No Point entitles the Klallam to one-half of the harvestable fish catch within their usual and accustomed territory. The various alternatives have implications in terms of the overall quantity of fish available to all fishers, the season of availability, and whether the fisheries are wild or planted stocks. It is not clear, however, which alternatives are consistent with the treaty's intent. Restoration of wild (pre-dam) stocks, for example, under dam removal alternatives, would curtail hatchery stocking and reduce the fish available. Would this be consistent with the treaty because it involves wild stock restoration, or inconsistent with the treaty because it reduces available fish for Native Americans? The answer would be more a matter of opinion than fact. The Executive Summary in the EIS instead stresses technical issues having to do with the probability of fisheries restoration under each of the alternatives, and consequences of each for tribal fishers.

See also response CI-24.

CI-18: The context of the Commission's decision is explained at the beginning of Section 5.6.2.

CI-19: Section 1.2.1.2 has been modified to reflect the petitions for review of the Commission's ruling.

CI-20: The FERC's interest is in resolving the issue as expeditiously as possible. The information provided on licensing status is noted.

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Section 1.2.2.1, Page 1-3.

CI-21 The narrative omits the fact that the Elwha Project was constructed in violation of Washington State law, which required all dams to provide passage facilities for migratory food fish. This passage was expressly omitted by the owners.

Section 1.2.2.1, Page 1-3.

CI-22 The description of the dam failure is overly compressed. Further explanation of the dam's failure, the magnitude of the blowout, and the ad hoc and only partly effective measures that were taken in response should be made, here and in Section 2.1.2.3.

Section 1.4, Page 1-5.

CI-23 As we and others have stated previously, the third resource objective, "provision of renewable hydroelectric energy", is stated incorrectly. It should be "provision of environmentally sound energy for the Daishowa mill." Thus stated, the objective would better account for environmental damage from the projects and the availability of alternative and environmentally preferable sources of power.

CI-24 Furthermore, there should be a fourth objective: Consistency with tribal treaty rights. This was raised at scoping meetings: Why has it been ignored in the DEIS and deleted from the objectives?

Section 1.4.1, Page 1-6.

CI-25 The Long Live the Kings program has identified the Elwha River, by removal of the 2 dams, as having the greatest potential for wild fish restoration in Western Washington.

Section 1.4, Page 1-7.

CI-26 Ecosystem restoration in the Elwha River basin must include both the biological and hydrological components. The restoration of the gravel movement and supply of large organic debris to the areas downriver of the upper reservoir is a necessary component of ecosystem restoration. This is one more criterion in which the removal of the dams meets the needs of the basin, while the retention of the dams does not.

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CI-21: Comment noted.

CI-22: The staff is concerned with the dams' current and prospective condition, not its early history. Issues of dam safety are addressed in Sections 2.1.1.3 and 2.1.2.3.

Required safety inspections and analyses have shown the dams to be safe under the current criteria applied to hydroelectric developments. The dams are classified as "high hazard" under a uniform classification based on the height of dams and the volume of reservoir storage. The classification does not reflect the condition or likelihood of failure of the project structures, but rather the amount of development and human exposure that has occurred in the floodplain downstream from the dam. Deficiencies found by inspection or analyses are required to be addressed and corrected.

CI-23: The principal resource objectives were an outgrowth of the EIS scoping process, and the staff has no basis for modifying them at this point in the EIS process.

CI-24: See response CI-17. These issues are discussed in the DEIS in several places. Paragraphs on pages 3-109 and 3-110 discuss the provisions of the Treaty of Point No Point. Paragraph 2 on page 3-111 discusses the treaty in the context of Elwha dam construction. The potential restoration of treaty fisheries under dam removal alternatives is discussed on pages 4-72 and 4-138.

CI-25: Comment noted.

CI-26: Section 1.4.2 has been changed to include restoration of the natural river hydrology and aquatic biology.

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Section 1.4.2, Page 1-7.

CI-27 The report by Leopold et al. does not state the primary goal of the NPS. This goal is codified in Title 16 of the U.S. Code. Moreover, for this discussion it would be more proper to state that a management objective of the NPS in implementing its mission and goals is the perpetuation of natural processes and systems, not to maintain a snapshot of the land as it was when first viewed by European explorers.

Section 1.4.3, Page 1-8.

CI-28 As we and others have stated previously, this resource objective, "provision of renewable hydroelectric energy", is stated incorrectly. It should be "provision of environmentally sound energy for the Daishowa mill." Stated in this fashion, the objective would better account for environmental damage from the projects and the availability of alternative and environmentally preferable sources of power.

Section 1.4.3.1, Pages 1-8 to 1-11.

CI-29 The current regional load is approximately 16,000 average megawatts, while the two dams together produce approximately 10 average megawatts. The combined output of the two dams is therefore approximately .06% of the regional load. The impact of the two dams on the regional load is not only small (as stated on page 1-11), it is minuscule and negligible from a regional perspective. It would become more so if the Glines Canyon Dam were removed for jurisdictional reasons and, even if left in place, were operated as run-of-river with a corresponding drop in its power output. Fisheries responsibilities would likewise require a drop in power output in all scenarios.

Section 1.4.3.2, Page 1-11.

CI-30 Reality is lacking in this discussion. First, it makes no sense whatsoever to avoid small impacts from alternative generation at the expense of continuation of the massive impacts to the terrestrial and aquatic environment that these two dams have, are having, and would continue to have if retained. What is the impact of 10 average MW of coal generation versus the impacts of these two projects? The answer is that the environmental impacts of these projects on the Elwha are orders of magnitude greater. Why is this not stated in the DEIS? It should be so stated.

CI-31 Second, coal-fired generation would not be the resource that

CI-27: The concept of perpetuation of natural processes has been added to Section 1.4.2.

CI-28: Refer to response CI-23. The suggested wording would completely ignore the river's hydroelectric potential and the contribution the hydroelectric projects can make toward freeing up other conservation and generating resources to serve the region's loads.

CI-29: Comment noted.

CI-30: The comment fails to consider the adverse impacts that can be expected with dam removal.

CI-31: Current regional coal plant capacity is used at less than full capacity. It is the staff's view that sudden reductions in regional resources (or, conversely, sudden increases in regional loads) would very likely be adjusted for through increased coal plant utilization.

CI-31 com'd would provide replacement power for the dams when they are removed. It is a fallacy even to consider that this would occur.

CI-32 Third, the discussion is outdated. The Regional Council, in its new Northwest Conservation and Electric Power Plan, has stated that no new coal-fired generation will be needed or developed for the Region. At the very worst, the Region would use gasified coal, with a consequent great reduction in impacts.

CI-33 Section 2.1.1.1, Page 2-1.

Most of the reservoir for Glines Canyon Dam, styled as "Lake Mills", inundates lands of the Olympic National Park. This fact should be stated here.

CI-34 Figure 2-1, Page 2-2.

The boundary of the park is not accurate. This is also the case for some of the other illustrations of park boundaries: please consult with the NPS regarding the correct boundaries.

CI-35 Section 2.1.2.3, Page 2-8.

In Section 1.2.2.1 the description of the dam failure before 1916 is overly compressed; in this section it is completely missing. This is unacceptable, and must be remedied by further discussion.

A full explanation of the dam's failure, the magnitude of the blowout, and the ad hoc and only partly effective measures that were taken in response should be made, here and in Section 2.1.2.3. Furthermore, the PMF criteria that the dam can withstand are not described. It hardly seems possible that this rickety dam that leaks over 100 cfs through its foundation could withstand a full PMF. The precise PMF criteria that can be met and also those that cannot be met must be specified.

We are aware, for example, of the low regard that hydrologists and engineers give to the material underlying the dam in the area of the old blowout. In the studies of the dam for this DEIS, the evaluators from EBASCO were not allowed to take core samples from the region under the dam due to the fear of subsequent instabilities that such coring might cause. It is difficult to conceive of another location where such a condition would be allowed to persist.

It would be accurate to say that at present the foundation is in a metastable condition, subject to a potential failure from any

CI-32: The text has been updated to reflect the Council's 1991 power plan.

CI-33: This fact is pointed out in Section 1.2.1.1.

CI-34: The park boundaries have been modified on Figure 2-1 to better represent the existing park boundary.

CI-35: Since 1979, the Elwha Project has been subject to FERC's dam safety inspection program. Under this program, independent inspectors analyze the dam's condition and safety issues in keeping with FERC criteria and recommend corrective actions when necessary. Actions to increase Elwha dam stability have been recommended and taken. Dam safety inspections will continue every 5 years. The repair and replacement schedule (Table A-8) recognizes the dam's age and condition.

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CI-35 cont'd

of a number of causes, apparently including core sampling. Such a metastable foundation poses a very real and tangible threat to the downriver area. This condition of the foundation must be stated explicitly in the final EIS.

The tangible potential for failure also should apply to a devaluation of the dam and should result in a recognition of the fact that the dam is at or past the end of its design life. These points should be incorporated in cost and economics discussions throughout the EIS.

CI-36

Section 2.2.1.2, Page 2-12.

The Elwha Project does not operate in a true "run of river" mode, because the Glines Canyon Project is operated in part to provide flows to meet the needs and capacities of the Elwha Project.

CI-37

Section 2.2.2.3, Page 2-14.

Most boat launch improvements would be inconsistent with the low intensity, natural environment management of the Olympic National Park.

CI-38

Section 2.2.4, Page 2-15.

The estimated energy output and costs are based on the Applicant's unwarranted assumption that current operations could be extended without significant change.

CI-39

Section 2.2.5, Page 2-15.

It should be noted that the only measures considered for improving the Applicant's proposal were some fisheries measures. There is nothing to address park ecosystem, wildlife, tribal, or other concerns.

CI-40

Table 2-5, Page 2-16.

How are the numbers for the fish facilities and restoration derived?

CI-41

Sections 2.3.1. and 2.3.2, Pages 2-17 to 2-20.

The discussion of the disposition of rubble is much too conventional and does not consider some of the unique aspects of this location and situation. For example, materials from

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CI-36: Because outflow of Lake Aldwell equals inflow, the Elwha Project can technically be considered to operate in a run-of-river mode. However, the staff recognizes that flows in the middle section of the Elwha River, Lake Aldwell, and lower section of the Elwha River are highly influenced by water elevation fluctuations of up to 10 feet in Lake Mills. Consequently, discharges in this section of the river often do not follow natural flow patterns.

CI-37: The boat launch improvements are described in Section 4.1.6.2 and consist of minor improvements to the existing facility.

CI-38: The staff believes this assumption to be reasonable.

CI-39 Measures considered for improving the applicant's proposal include water quality, fish passage, vegetation and wildlife, land use, recreation, aesthetics, socioeconomics, and cultural resources (refer to Table 2-6).

CI-40: These figures are based on applicant estimates reviewed by the staff.

CI-41: The staff assumes a "worst-case scenario" when evaluating the amount, location, and cost of rubble disposal and agrees that there may be a more cost-effective means of disposal. A staff recommendation to identify alternative means of rubble disposal has been added to Section 4.2.4.1.

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CI-41 cont'd demolition of the dams might also be used in the stabilization efforts for Ediz Hook, for construction supply, or offered for sale by local merchants to tourists as mementos of the restored site, as with the Berlin Wall. Scrap and wastage are not the only available uses for the material.

CI-42 Section 2.3.4, Pages 2-22 to 2-23, Section 2.4, Page 2-24, and Section 2.5, Page 2-25.

Loss of power production is not properly "foregone power generation" cost. Under the Federal Power Act there is no vested right to the production of power, and a decision not to license or operate the dams does not produce a "cost".

CI-43 Sections 2.7, 2.7.1, and 2.7.2, Pages 2-28 to 2-34.

We have previously identified methodologies available to assign dollar values to these resources.

CI-44 Table 2-12, Page 2-31.

This table omits consideration of a number of costs, including the Ediz Hook costs (savings in the case of dam removal), Elwha Dam replacement even in a retention alternative (see above), and others. Costs of mitigation for shellfish impacts, and for providing for gravel movement and large organic debris are not included. These cannot be ignored, and would be very costly to address with the dams in place.

Operation of Glines Canyon would likely be constrained to run of river, not the current regime. There are matters such as screens, spill, monitoring, responsibility for passage success and fish rearing success that are not factored into the analysis.

The table has no consideration of non-developmental costs and environmental costs and benefits. The most notorious aspect of these two dams has been the more than 70 years of subsidized power production through the externalization of costs to the environment.

The table omits consideration of cumulative impacts perpetrated before and since the expiration of the license for Glines Canyon Dam, by the illegally operating Elwha Dam, and of responsibility for accumulated impacts to the tribal fisheries. These costs, both in their own right and considering the formidable legal costs, would provide some indication of the vast environmental costs incurred by these dams, which would continue in the dam retention alternative.

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CI-42: If the dams were to cease producing energy, there would most definitely be a cost to replace it. The notion of a "vested right" has nothing to do with the issue.

CI-43: Section 2.7.2 has been clarified to explain that it is a cost analysis with limited scope. The comparative dollar costs of the alternatives must be considered in conjunction with the full range of environmental effects described elsewhere in the EIS.

CI-44: Refer to response CI-43. The table is not intended to be an all-inclusive array of benefits and costs. It accurately presents what is intended. The cost of staff-recommended measures has been included in the applicant's proposal with supplemental measures.

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CI-44 cont'd Elsewhere we speak to the omission of major mitigation responsibilities and costs for the Applicant's proposal. Thus, the Applicant's dam retention proposal capital and O&M costs, and total cost are seriously underestimated.

CI-45 Section 3.1, Page 3-1.

Here, and throughout the DEIS, the two projects are described as approximating run-of-river operations. This is based on assurances by the Applicant that are not backed by specifics on project operations. The Glines Canyon Project is not currently operated as run-of-river, and because its reservoir is currently fluctuated for power production neither can the Elwha Project be styled as run-of-river. The DEIS is entirely too loose in its use of this terminology.

CI-46 Figure 3-1, Page 3-2.

Park boundaries are inaccurate and outdated.

CI-47 Section 3.2.2, Page 3-21.

The State has a fish rearing channel, not fish rearing ponds. There is only one tribal hatchery on the river.

CI-48 Section Table 3-5, Page 3-28.

Sturgeon and smelt should also be included.

CI-49 Section 3.4.1, Page 3-29.

The JFWA considers RM 16 to be a conservative estimate for the upstream penetration of pink salmon. Certainly the example of the Dungeness pinks suggests that the Elwha pinks might have passed this barrier.

CI-50 Section 3.5.2.1, Page 3-54.

The NPS reports that the elk densities quoted are large overestimates, based on valley floor census and not on total habitat. Corrected densities are 15/sq. mile for the Hoh to 19/sq. mile for the Queets. Given the large inaccuracy in the densities, the HSIs should be reexamined.

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CI-45: Section 4.1.2.2 has been revised to state that the Glines Canyon dam under the applicant's proposal would not operate in a run-of-river mode.

CI-46: Figure 3-1 has been modified to better represent the location of the park boundaries.

CI-47: Comment noted.

CI-48: Additional statements in the text have noted that these stocks were in the river. The staff does not believe they need to be added to Table 3-5 (in main text) because this table only shows stocks that have reasonable estimates of production. The relative abundance, frequency of occurrence, and importance of these stocks in the past is very unclear.

CI-49: The text has been changed in Section 3.4.1.2.

CI-50: The elk densities in Section 3.5.2.1 have been corrected using NPS data.

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Section 3.6.1, Page 3-71

The park has been designated as an International Biosphere Reserve, not a Biosphere Reserve, and as a World Heritage Site, not a World Heritage Park. These terms should be corrected to reflect the proper designation.

CI-51 The World Heritage Site designation is not simply a land use or ownership designation. The World Heritage Convention is implemented in the United States through the 1980 amendments to the National Historic Preservation Act, and evaluations of impacts to such sites and protection of sites from impact are accomplished and enforceable through the Section 106 procedures of the NHPA. We have testified to this before the FERC at the scoping hearings, and have included this information in several filings to the Commission. Yet the DEIS has failed to conduct this evaluation to Section 106 standards.

Section 3.6.3, Page 3-75.

CI-52 Only one river system has been designated under the State Scenic Rivers Program. The entire South Fork of the Skykomish River, and portions of the mainstem Skykomish River, North Fork of the Skykomish River, Beckler River, and Tye River have been designated.

Section 3.7, Page 3-80.

CI-53 The Elwha River drainage is an important backcountry use area.

Figure 3-16, Page 3-82.

CI-54 The park boundaries are outdated and inaccurate.

Section 3.7.2, Page 3-83.

CI-55 The users of this area generally find the reservoir to be an unsightly intrusion that they avoid.

Section 3.8.2, Page 3-88.

CI-56 Lake Mills is not "the portal" to anything in the park. It intrudes into and detracts from wilderness, and adversely impacts the International Biosphere Reserve and World Heritage Site.

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CI-51: The term "World Heritage Park," taken from an NPS publication, has been changed to "World Heritage Site" throughout the text. Section 3.6.1 has been modified to refer to the National Historic Preservation Act (NHPA). The 1980 amendments to the NHPA state that in nominating a property to the World Heritage Committee, the Secretary of the Interior "shall include evidence of such legal protections as may be necessary to ensure preservation of the property and its environment (including restrictive covenants, easements, or other forms of protection)." Since the property is within the Olympic National Park, this would suffice as protection under NHPA and the World Heritage Convention. In addition, when evaluating potential changes to existing projects, the Commission adopts a forward-looking approach, using present conditions as a baseline and concentrating on current resource needs and opportunities for project improvement. Regarding the World Heritage Site, the staff believes no other evaluation is necessary.

CI-52: Comment noted.

CI-53: The first paragraph under Section 3.7, Recreational Resources, describes this important resource.

CI-54: Figure 3-16 has been revised to better reflect the locations of the park boundaries.

CI-55: Comment noted.

CI-56: Comment noted.

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Section 3.8.2, Page 3-89.

CI-57 The correct name for the state agency is the Washington State Office of Archaeology and Historic Preservation, not State Office of Historic Preservation. The director of the agency is the Washington State Historic Preservation Officer.

Section 3.8.2, Pages 3-89 to 3-90.

CI-58 The National Register of Historic Places is correctly identified on page 3-89, and incorrectly on page 3-90. Generally, when the name is shortened it is referred to as the National Register, not National Historic Register.

Section 3.8.4, Page 3-95.

CI-59 The weathered concrete of the two dams does not blend into the rock: It is readily recognizable for what it is.

Section 3.8.4, Page 3-97.

CI-60 The surge tank, while painted green, has a different tone and texture from the surrounding area, and except under certain lighting conditions is in contrast with and readily distinguishable from the adjacent area.

CI-61 The right-of-way vegetation may be under special management, but the right-of-way is readily distinguishable. The phrase "thereby mitigating visual impacts within the park boundaries" would suggest that all visual impacts of the right-of-way are mitigated: this is by no means the case.

Section 3.9.3.1, Page 3-104.

CI-62 The early hatchery operation, a half-hearted attempt at some mitigation for the illegal construction of the Elwha Dam without fish passage, was abrogated by the owner in contravention of an agreement with the State.

Section 3.9.3.1, Pages 3-106 and 3-107.

CI-63 The DEIS stated its intention to refrain from dollar values for environmental resources. We note that some were included anyway on these pages.

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CI-57: The text has been changed in Section 3.8.2 to reflect proper name.

CI-58: The text has been changed in Section 3.8.2 to reflect proper shortening of name.

CI-59: The weathered concrete is similar in color to the adjacent rock walls. The visual contrast of the dam with its immediate surroundings is due to a contrast in form and texture, and the description has been added to the text.

CI-60: A revised description of the visual impact of the surge tank has been added to the text.

CI-61: The term "mitigating" has been replaced in the text with "reducing."

CI-62: Comment noted.

CI-63: As noted in section 2.7.2, the economic analysis focuses on the dollar cost of constructing or removing facilities, incremental increases in operating and maintenance costs, and the value of power generation foregone. Dollar values are not assigned to nondevelopmental resources. The discussion of socioeconomic effects is different, however. In those sections, dollar values are used where they are known, such as the value of the commercial catch or the change in county tax revenue. These values are legitimate expressions of positive or negative socioeconomic effects, but are not included in the costs analysis.

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Section 3.10, Page 3-107.

CI-64 Evaluation and consideration of traditional cultural use of the area is a necessary part of Section 106 review. Guidance for this is provided by the National Park Service, and FERC explicitly directs all Applicants to comply with this guidance.

Section 3.10.1, Page 3-109.

CI-65 The 25 MW figure is a capacity figure, not an average generation amount.

Section 3.10.2, Page 3-110.

CI-66 The description of the surveys is not adequate. The methods, representative photographs, maps of the survey area, and other information should be provided. The treatment of the creation site in the DEIS is not adequate.

Section 3.10.2, Page 3-110.

CI-67 While the two projects have been listed on the National Register, the EIS should explain that the NHPA does not preclude the removal of the dams after proper documentation. The statement of significance in the nomination for the Elwha Project explicitly recognizes the environmental damage caused by the two projects, and the potential need to modify or remove the structures in order to rectify those impacts.

Section 3.10.3, Page 3-111.

CI-68 The surveys and consultation clearly do not meet the requirements for consideration and evaluation of traditional cultural use. These aspects of cultural use must be evaluated in order to meet the requirements of Section 106 of the NHPA.

Section 4.1, Pages 4-1 to 4-73.

CI-69 Descriptions of the dam retention alternative are flawed by setting of the baseline at current conditions. Time and again massive continuing impacts are dismissed with a statement that there would be no change from current conditions.

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CI-64: See response EKT-2.

CI-65: The text has been changed in Section 3.10.1.

CI-66: See responses DOI-14, EKT-82, and EKT-2.

CI-67: See response DOI-112.

CI-68: See response EKT-2.

CI-69: Current conditions serve as the baseline from which to assess potential licensing actions for existing projects.

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Section 4.1.1, Page 4-1.

CI-70 Status quo conditions with regard to sediment transport means continuance of the Licensee's major adverse impact to the environment, blocking the movement of bedload materials downriver.

Section 4.1.2, Page 4-2, and Section 4.1.2.2., Pages 4-4 and 4-5.

CI-71 As noted previously, conditions would not resemble those of run-of-river operations. Run-of-river operations were not implemented by the Applicant in 1975.

Section 4.1.3.2, Pages 4-12 to 4-34.

CI-72 At various places in this discussion, the baseline problem and the dismissal of continuing impacts can be seen.

Section 4.1.3.3, Pages 4-34 to 4-38

CI-73 Run-of-river operation at Glines Canyon project would have a cost of $4.3 million; this should be included in the economic studies and depictions.

CI-74 Based on survival studies to date, spill at a level of at least 450 cfs should be maintained until the proposed studies on page 4-36 are completed.

CI-75 We agree with the JFWA that screens at Glines Canyon Dam are not optional measures.

CI-76 The costs of the various staff-recommended measures should be incorporated into economic analyses and representations.

Section 4.1.4.2, Pages 4-41 to 4-51.

CI-77 The Applicant's proposal may result, overall, in improvements, but if so only in the Elwha Project area and not in the Olympic National Park. A "fair" chance for restoration of two stocks does not warrant the conclusion that populations of some wildlife species that feed on salmon carcasses would "likely" increase.

CI-78 Again, discussion is limited to the changes from existing conditions, and is directed away from the major existing and continuing adverse impacts of the dams on wildlife.

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CI-70: Comment noted.

CI-71: Refer to response CI-36.

CI-72: Refer to response CI-69.

CI-73: The cost of run-of-river operation has been included in the cost of the applicant's proposal with supplemental measures.

CI-74: The staff recommendation for spill flow is 200 cfs, pending the outcome of additional studies (see Section 4.1.3.3).

CI-75: The staff considered all factors and determined that screens at Glines Canyon dam are not warranted (see Section 4.1.3.3).

CI-76: They have been included in the cost of the applicant's proposal with supplemental measures.

CI-77: Although the applicant's proposal would not restore the habitat currently occupied by the Glines Canyon Project, the staff does not agree that the applicant's proposal would result in no improvements within ONP. Based on the staff's evaluation, there is a fair chance that the applicant's proposal would restore coho runs to the Elwha River within ONP and a good chance that chinook runs would be restored. The staff believes that a fair-to-good chance of restoring two runs of anadromous fish to the middle and upper reaches of the Elwha drainage would result in more available biomass for wildlife that consume salmon carcasses, and it is likely that populations of some species may increase in ONP. Since pink and chum salmon runs would not be restored, the applicant's proposal is not expected to contribute enough biomass to restore wildlife populations to pre-project conditions.

CI-78: This is fully consistent with the use of current conditions as the baseline for impact assessment. Refer to response CI-69.

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Section 4.1.4.3, Pages 4-52 to 4-54.

CI-79 The current projects maintain a continuing negative impact on threatened and endangered species, but this is not acknowledged in the summary conclusion at the beginning of this section.

Section 4.1.4.4, Page 4-54.

CI-80 The doubtful quality of the wildlife and ecosystem restoration benefits to be derived from two fair potentials for anadromous fish restoration have been discussed previously.

Section 4.1.5, Page 4-55.

CI-81 We do not agree with the statement that "The applicant's dam retention alternative would have minor adverse effects on land use in the project area." The dams have had and continue to have major adverse impacts on the Olympic National Park lands and on the riverine environment, and the dam retention alternative would perpetuate these impacts. The alternative would also perpetuate the inconsistent, intrusive and adversely impacting use of lands inside the park for hydroelectric generation.

CI-82 It is also not true that the proposal "would generally be consistent with most relevant comprehensive plans." In fact it is fully inconsistent with the Olympic National Park plans, Pacific Fishery Management Council's Fishery Management Plan for Commercial and Recreational Salmon Fisheries, and Washington Department of Fisheries's Hydroelectric Project Assessment Guidelines, and partly inconsistent with the Washington Department of Wildlife's Strategies for Washington Wildlife. This leaves consistency only with Protected Areas and county plans, which were designed around and to be consistent with the existing projects, and the SCORP.

CI-83 This is not a record of consistency; rather, it is a sorry case of inconsistency with almost all of the major environmental resource protection plans of relevance!

Section 4.1.5.4, Page 4-56.

CI-84 Contrary to the statement in the DEIS, we are aware that the Pacific Fishery Management Council has determined that the Applicant's proposal is inconsistent with the Fishery Management Plan for Commercial and Recreational Salmon Fisheries, and that only the dam removal alternative is consistent with the Plan. The PFMC is the lawful agency for making this determination.

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CI-79: Comment noted. See responses C-78, SOW-166, and DOI-160.

CI-80: Comment noted. See responses CI-14 and CI-77.

CI-81: Since the dam retention alternative would not dramatically alter existing uses, the future effects on land use would be minor. In evaluating potential changes to existing projects, the Commission adopts a forward-looking approach, using present conditions as a baseline and concentrating on current resource needs and opportunities for project improvement.

CI-82: Comment noted. The staff did not reach the same conclusion regarding consistency as described in Section 4.1.5.

CI-83: Comment noted.

CI-84: The consistency determinations were made by the staff based upon the objectives, policies, and goals of each plan in relation to the alternative. Consistency determinations often cannot be judged simply either consistent or inconsistent, but involve varying degrees of consistency. Degrees of consistency are assigned to a project modification or proposal that works toward a goal described in a plan.

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Section 4.1.5.2, Page 4-56.

CI-85 The statements regarding consistency with Park resource plans is in error. Fair potential to restore weak runs of two stocks to the upper watershed would not contribute meaningfully, if at all, to restoration of the ecosystem.

CI-86 Encouragement of high-intensity use of Lake Mills is also inconsistent with Park management and would not be acceptable to the Park or to us.

Section 4.1.6.2, Page 4-58.

CI-87 As noted, the recreational development at Lake Mills is disapproved both by the National Park Service and by us.

Section 4.1.6.2, Page 4-60.

CI-88 The drawdown of 2 feet leaves a 2-foot-high barren ring around the reservoir. This is unsightly, and hardly an attraction for Olympic National Park.

Section 4.1.8.2, Pages 4-63 to 4-70.

CI-89 Full restoration of the fish runs is necessary. It is not acceptable to propose (cf. page 4-65) falling back on the WDF hatchery in the event that restoration goals are not met. If the Commission is wary of uncertainties in the Applicant's dam retention proposal, and believes there to be a strong likelihood that fish restoration will not succeed, these uncertainties and risks should be acknowledged upfront, and increased weight should be given to the dam removal alternative.

CI-90 Again on page 4-67, hatchery production is not acceptable mitigation "in the event restoration of a wild run is unsuccessful." The existing hatchery is necessitated by the impact of the dams on the environment: this should be the Licensee's responsibility, and not that of the Bureau of Indian Affairs.

CI-91 Again on page 4-68, hatchery production is not acceptable mitigation "in the event restoration fails."

Section 4.1.8.3, Page 4-70.

CI-92 Adverse economic and social impacts from the dam retention alternative would not be ameliorated by the measures proposed

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CI-85: The staff considers even a fair potential for reintroducing stocks into the watershed above the dams an improvement over existing conditions, that would enhance the goal of restoration.

CI-86: Section 4.1.5.2 has been modified to use "concentrate" rather than "encourage."

CI-87: The improvements to the boat launch site on Lake Mills are not substantial and primarily consist of simply upgrading the existing development. In addition, the improvements would be useful to the fish passage program at Glines Canyon dam. The NPS approves of concentrating high intensity use in park periphery areas, and the day use facility at Lake Mills meets this intent.

CI-88: A 2-foot drawdown is minimal, and typical of natural processes in natural lakes

CI-89: See responses DOI-179 and NMF-57. The staff believes the overall potential to successfully restoring the stocks indicated is reasonable with due consideration of the uncertainties, but no future activity that relies on many factors both within and outside of the basin can be absolutely predicted. While dam removal has advantages over dam retention for potential restoration of stocks, this option too suffers from many of the same factors that affect potential of success for restoration, plus additional ones. Many factors that would affect the chance for restoration are out of the applicant's control and responsibility. Even with no dam-induced mortality, if improper efforts are made to manage the stocks, the wild stock restoration could fail. Although the staff believes the predictions of restoration potential are sound, if significant deviations from staff assumptions were to occur or some factors became more important than believed (e.g., stock suitability), then the restoration may not achieve expectation.

However, the staff believes that fishery managers can make the necessary decisions to protect and perpetuate the stocks and that the estimates of other factors affecting restoration are reasonable. The staff has discussed the potential level of restoration in Sections 4.1.3.2 and 4.2.3.2.

The statements about back-up activity, including hatcheries to supply harvestable stocks, are not an indication of unreasonable uncertainty for the recommended action. Hatcheries are less desirable and do not meet the established goals that the EIS used for measuring success, but their use might increase available harvest. The current lower river hatchery operations document that they increase harvest. While they are not the preferred mitigation, hatcheries might be a backup to lost harvest if success is not as predicted or to supplement the number of harvestable fish. The foregoing discussion is pertinent in this section, because the section discusses the

CI-92 cont'd here. The number of jobs provided by the operation are few, and do not present anything close to the opportunities that fish restoration would. However, these costs should be included as part of the Applicant's costs.

Section 4.1.8.4, Page 4-71.

CI-93 The annual costs of $100,000 (cf. page 4-70) of the "periodic beach replenishment to protect Ediz Hook" should be assigned to the Applicant and incorporated into economic analyses. They should not be the responsibility of the Corps or anyone other than the Applicant.

Section 4.1.9.2, Page 4-72.

CI-94 It is difficult to determine how a fair potential for partial restoration of upstream anadromous fish runs would be consistent with the treaty rights of the Lower Elwha Klallam Tribe. The discussion in Section 4 also makes it clear that the Commission staff sees considerable uncertainty regarding any restoration success under the dam retention alternative.

CI-95 There would not appear to be any basis for the assertion that the (partial) restoration of the fishery would "bring a restoration of treaty rights," or that such (partial) restoration of the fishery would "partly compensate the Klallam for the loss of cultural values and practices brought about by dam construction."

Section 4.2.1.2, Page 4-83.

CI-96 The economic benefits that result from this renewed contribution of sediment to the Ediz Hook area should be included in the cost computations for the dam removal alternative.

Sections 4.2.2, Page 4-85, and 4.2.8.2, Page 4-136.

CI-97 Studies underway indicate that protection of the water quality of City and other water supplies can be accomplished in a reasonably straightforward and cost-effective manner.

CI-90: Refer to response CI-89.

CI-91: Refer to response CI-89.

CI-92: The word "ameliorate" has been replaced by the word "reduced." The costs of all recommended mitigation under the applicant's proposal would be borne by the applicant.

CI-93: The cost of each alternative is addressed as the change in costs that would be associated with implementing that alternative. Under most of the alternatives, there would be no change in the beach replenishment program and no change in program costs. Under the dam removal alternative, beach replenishment costs would probably decline gradually after 10 to 20 years, as sediment from the Elwha River is deposited at Ediz Hook. Staff believes that this benefit, which would not begin for 10 to 20 years and would occur only gradually thereafter, would be negligible.

CI-94: See responses DOI-226, CI-17, and CI-24.

CI-95: See responses DOI-226, CI-17, and CI-24. Reference to restoration of treaty rights removed.

CI-96: The cost analysis is limited to the costs incurred by the applicant and/or the entity removing the dams. Costs and benefits accruing to others are treated separately, along with positive and negative environmental effects that have no dollar value assigned to them.

CI-97: Comment noted. Section 4.2.2.3 has been revised to describe the staff-recommended use of Ranney collection facilities to obtain high quality water for industrial users. Costs for these proposed facilities are provided in Appendix A. A water quality monitoring program for drinking water would be required by the State Department of Health under dam removal alternatives and is described in Section 4.2.2.3.

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Sections 4.2.7, 4.2.7.1, and 4.2.7.2, Pages 4-130 to 4-131.

The DEIS makes several unwarranted subjective judgments here. It is difficult to credit statements that suggest that concrete, dams, powerhouses, transmission lines and slack-water reservoirs with drawdown areas are more aesthetically appealing than the natural riverine environment with a free-flowing river and associated riparian areas, fish and wildlife, and the entire milieu of the natural environment.

CI-98 The Conservation Intervenors represent over 30,000 people that care for the natural environment and use and appreciate the beauty of the Olympic National Park. All Intervenors have engaged in the struggles to establish and preserve the Olympic National Park. We can safely state that our members would not be offended by the vacated reservoirs and revegetating areas; on the contrary, there would be great interest in and appreciation for the effort.

Furthermore, it is our opinion that this would likewise be the response of the overwhelming majority of visitors to the Park. In fact, there would in all likelihood be an increased visitation by people who wanted to view the restoration in progress.

Section 4.2.7.4, Page 4-131.

CI-99 We do not agree that the two reservoirs are "scenic waterbodies": in particular, Lake Mills is an unattractive intrusion that is avoided by most visitors to the Park. By no means would its removal be an "unavoidable adverse impact"; rather, it would be a tremendous benefit to the Park and the public.

Section 4.2.8.2, Page 4-135.

CI-100 We have made several submittals to the Commission that address the need for power and the supply of cost-effective replacement power. The discussion in this section should be revised to incorporate discussion of the information in our submittals.

Section 4.2.8.2, Page 4-136.

CI-101 See comment to Section 4.2.2. above.

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CI-98: Changes in text reflect the fact that different viewers would react differently to existing conditions at and to changes to the Elwha and Glines Canyon projects.

CI-99: See response CI-98.

CI-100: The cost of power analysis in Section 2.7.3 has been revised, and Section 4.2.8.2 reflects those changes.

CI-101: See response CI-97.

COMMENTS OF CONSERVATION INTERVENORS

CI-102

Section 4.3.4.2, Pages 4-149 and 4-152.

Restoration of the pinks and chums is necessary in order to have the greatest improvement in wildlife, and this will not occur if the Elwha Dam is retained.

CI-103

Section 4.3.4, Page 4-155.

Removal of Glines Canyon Dam with retention of the Elwha Project would not meet our goals nor those of the NPS for restoration of the ecosystem of the Olympic National Park. The large pink and chum salmon runs, probably accounting for half of the potentially restorable populations, would not be restored to the Park.

CI-104

Sections 4.3.7, 4.3.7.1, 4.3.7.2, and 4.3.7.4, Pages 4-159 to 4-160.

The comments for Sections 4.2.7, 4..2.7.1,4.2.7.4, and 4.2.7.4 apply equally to these sections.

CI-105

Section 4.4.3, Page 4-171.

The judgment that the overall prospects for fisheries restoration, given removal of only the lower dam, would be similar to those with removal of both dams is contrary to the evidence of record submitted by the JFWA and the Conservation Intervenors.

CI-106

Section 4.4.4.2, Page 4-179

Because the prospects for restoration of pinks, chums, and spring chinook with the Glines Canyon Dam left in place are not as good as suggested by the DEIS, the outlook for wildlife response to the restoration of anadromy must be considered an overestimate.

CI-107

Sections 4.5. and 4.5.1, Pages 4-193 to 4-195.

As is discussed above, new coal-fired generation is not a plausible replacement resource, and should not be considered further.

CI-108

Section 4.5.2, Pages 4-195 to 4-196.

Our submittals to the Commission have spoken to such concerns. The EIS discussion should be revised to incorporate information from these filings.

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CI-102: The staff agrees. See response DOI-231.

CI-103: The removal of the Glines Canyon Project with retention of Elwha dam would result in restoration of the habitat currently occupied by the reservoir. In addition, there is an excellent chance of restoring chinook runs and a good chance of restoring coho runs to ONP. Although pink and chum runs would not be restored, the additional habitat and the increase in available biomass from chinook and coho runs represents an improvement over existing conditions.

CI-104: The staff does not agree that prospects for restoration of pink, chum, and spring chinook are overstated with the removal of Elwha dam and Glines Canyon left in place. Therefore, the outlook for wildlife responses are not overestimated. See response CI-98.

CI-105: The text has been changed in Section 4.4.3.

CI-106: See response DOI-235.

CI-107: The text has been updated to reflect the Council's 1991 power plan.

CI-108: As written, the text conveys the staff's understanding of the local power supply and transmission system as reported to the staff by BPA officials.

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CI-109 Section 5.0

See discussion at Part IV, below.

Section 8.0, Pages 8-1 to 8-14.

CI-110 The list of recipients is outdated for both agencies and environmental organizations.

Appendix A. Dam Retention Alternatives.

CI-111 As the JFWA have represented, both upstream and downstream passage facilities and satisfactory flows and spill would be required at both dams. State of the art measures would have to be placed to minimize mortalities at the various facilities, intakes, etc.

The JFWA has provided extensive analysis and critique of the Applicant's proposal, and in short find the proposal to be insupportable on numerous grounds. One particular shortcoming is the lack of any screen or bypass measures at Glines Canyon Dam; many others are noted by the JFWA.

Appendix A, Part 5, Pages A-74 to A-80, and Part 6, Pages A-81 to A-101, and Part 7, Pages A-102 to A-106.

CI-112 The tangible potential for failure at the Elwha Dam should result in a devaluation of the dam and in a recognition of the fact that the dam is at or past the end of its design life. These points should be incorporated in cost and economics discussions.

CI-113 Loss of power production is not properly "foregone power generation" cost. Under the Federal Power Act there is no vested right to the production of power, and a decision not to license or operate the dams does not produce a "cost".

Appendix A, Part 8, Pages A-107 to A-113.

CI-114 At several places, the DEIS mentions information supplied by the Applicant and its consultants, the Commission and its staff and consultants, and of the JFWA. On the subject of replacement power, the Seattle Audubon Society, Friends of the Earth, Olympic Park Associates, and Sierra Club have made several detailed submittals on replacement power options and configurations, some of which could profitably be included in the discussion here. Incorporation of information from these submittals would add depth and specificity to what is otherwise mostly a generic

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CI-109: See responses beginning with CI-117.

CI-110: The list reflects FERC's most current records.

CI-111: See Section 4.1.3.3 for discussion of measures.

CI-112: The staff's repair and replacement schedule, with accompanying costs, reflect the age and current condition of the project.

CI-113: Refer to response CI-42.

CI-114: EIS Appendix A, Part 9, Sections 9.1 and 9.4 have been augmented with additional energy audit data.

CI-114 cont'd

discussion.

In particular, our submittals, and letters from BPA, speak to conservation and cogeneration potential at the Daishowa America mill. We believe that the Daishowa America company would be more supportive now than in the quoted letter of March 1990 (cf. page A-108) of the potential for replacement power through cogeneration and conservation, and of the cost-effectiveness of that replacement power through arrangements with BPA directly or via Port Angeles City Light.

CI-115

The discussion in Sections 8.4-8.6, 8.8 and 8.9 (and probably also 8.10) is basically irrelevant. As noted above, coal-fired thermal plants will not be used to provide replacement power.

CI-116

Appendix B. Dam Retention Alternative.

The JFWA believes that many of the survival estimates are high.

IV. SECTION 5.0 "Summary and Staff Conclusions"

CI-117

Section 5.0., Page 5-1.

We take strong exception to the statement that "At issue in the EIS, principally, is the extent to which anadromous fish restoration would be realized with the applicant's proposal." This is serious misrepresentation of the issues, of the decision that is to be made, and of the responsibilities of the Commission.

At issue is the public's interest in the Elwha River and its resources, and the proper balance in this case between the protection and restoration of the natural environment, the power development, the protection and conservation of the national park and international biosphere reserve, local socioeconomic concerns and replacement power availability, restoration of all species and stocks of anadromous fisheries, tribal treaty rights and cultural concerns and world heritage site considerations, and others.

If the DEIS is to condense the articulation of the decision, the question before the Commission is whether the prospects of restoration of fish and the national park are of such magnitude that it would justify removal of the dams and replacement of the dams' output with some other cost-effective resource such as conservation. The Conservation Intervenors emphatically believe that the answer to this question is yes. Fundamentally the native stocks of Elwha fish need access to this and only this

CI-115: Information on potential environmental effects is provided for all conservation and generating resources in the Council's portfolio.

CI-116: The survival estimates have been modified slightly (see Appendix B).

CI-117: The referenced text has been deleted to guard against oversimplification.

CI-117 cont'd river, while the DEIS itself shows that the mill can obtain cost-effective power supply from a number of different sources other than the dams. This is the simple verity before the Commission.

The staff's assertion in the DEIS must be corrected. For the Commission to consider and decide on the basis of the statement in Section 5.0 would be a decided failure in its responsibility to Congress and to the American people.

Section 5.0, pages 5-1 and 5-3

CI-118 We object to the statement that "the resource agencies and the tribe have been unwilling to suggest that one species or stock is more important, in terms of restoration, than another." The JFWA and the Tribe have repeatedly told FERC that ALL the species are important for recovery of the fish runs and the national park.

Table 5-1, "Principal Alternatives," page 5-4

CI-119 This table provides no indication of either varieties or numbers of anadromous fish restored under these alternatives. This information is vital to an accurate portrayal of the impacts of the various alternatives.

CI-120 Again, the capital costs for the dam retention do not include the price of measures recommended by the JFWA or the FERC staff.

Table 5-2, "Rank Order of Alternatives," page 5-4

CI-121 This table is completely inappropriate, because it gives no indication whatsoever of magnitude of difference between the various alternatives. In fact, dam retention, Glines Canyon removal only, and Elwha Project removal only, produce comparable results for fish and national park restoration.

Section 5.1.1, Page 5-5.

CI-122 The agencies and tribes believe the DEIS's analysis of fish restoration potential under the dam retention proposals is overly optimistic. There are a number of unresolved fish passage and habitat problems that detract from the assessments. The JFWA can supply a replacement for Table 5-3 that would more accurately depict the fish restoration potentials.

In any case, Table 5-3 must include quantities of fish as well as a qualitative determinations of prospects for restoration. Tables 4-14 and 4-21 (pages 4-66 and 4-134) provide this

CI-118: The statement as written best explains the equal treatment afforded all species in the EIS.

CI-119: The referenced information appears in Table 5-3.

CI-120: The cost of staff-recommended measures is included in the applicant's proposal with supplemental measures.

CI-121: This table is intended to rank the alternatives, not provide information on magnitude of differences. Magnitude of differences is provided in Tables 5-1 (power generation), 5-3 (fish restoration), and 5-4 (ecosystem restoration).

CI-122: The staff has retained Table 5-3 as a reasonable evaluation based on the criteria used (see Section 4.1.3.2 for evaluation criteria).

During scoping, the resource objectives were defined to mean the development of wild self-sustaining runs of fish even if these runs reduced available harvest (see Section 1.4.1). The resource agencies at scoping indicated that number of fish produced should not be part of the evaluation criteria, but that restoring all runs was the major consideration. Therefore, restoration of numbers of stocks is the primary criteria used in the evaluation, and the potential for restoration of these runs is the only factor that should be in Table 5-3. The potential number of fish produced is a secondary attribute and is not included in this table.

CI-122 com'd quantitative information, and FERC must represent these findings in order to accurately portray the prospects for fish restoration.

Section 5.1.2, Page 5-7.

CI-123 Ecosystem restoration in the Elwha River basin includes both the biological and hydrological components. The restoration of gravel movement and supply of large organic debris to the areas downriver of the upper reservoir is a necessary component of ecosystem restoration. This is one more criterion in which the removal of the dams meets the needs of the system, while the retention of the dams does not.

Table 5-4, Page 5-8.

CI-124 We do not agree that the Applicant's proposal provides "partial" restoration of the ecosystem of Olympic National Park. At best, it may provide some restoration of 1 or 2 fish stocks, but none of the many other biological and hydrological needs would be met, nor would the cultural, recreational, and other concerns for the Olympic National Park.

Section 5.1.3, Page 5-8.

CI-125 The likely replacement power options would have little or no contribution to atmospheric pollution. There is no support for the statement that the dam retention proposal would "reduce the quantity of atmospheric pollutants."

CI-126 While "renewable" and "nonpolluting" in the main, the hydroelectric generation has terribly harmed the environment for more than 70 years. And what are atmospheric pollutants but one form of environmental harm?! In the scale of things, these two dams have had a horrendous environmental impact, much greater than that of most other single developments.

Section 5.1.3, Page 5-8.

CI-127 As for the assertion that these dams contribute to regional power supply, the DEIS clearly shows that the projects have flunked the test of the marketplace. Other replacement resources, especially conservation, represent a much better value to the region. The power of the dams is supplied entirely to one mill, providing only 30-40% of its energy needs. It is not provided to the region, and is not available to the Port Angeles area. Indeed, the filings and statements of the Applicant have stressed time

CI-123: Section 5.1.2 has been changed to include the aquatic biology and natural river hydrology as components of the ONP ecosystem.

CI-124: Comment noted. See responses DOI-172 and DOI-239.

CI-125: The text has been modified to point out that the existence of the hydroelectric projects preclude the necessity to generate or conserve a comparable amount of energy by other means.

CI-126: Comment noted.

CI-127: The staff's calculations indicate that the cost of the applicant's proposal with supplemental measures is less than the region's avoided cost for comparable resources. The Daishowa Mill is part of the Port Angeles power supply area, and the reference to the projects' output as a percentage of the area's requirements is fully appropriate.

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CI-127 cont'd — and again the absolute tie of the power to the needs of the mill. It makes no sense to discuss these projects in terms of the Port Angeles power use, for the power is not available to the area.

Section 5.2.2, Page 5-10.

CI-128 — Water quality concerns can and would be met in a dam removal alternative. Observations of high water periods in the last two years show that there is substantial turbidity at these times.

Section 5.2.3, Page 5-10.

CI-129 — The elevated level of resident trout is an artifact of the removal of the natural anadromous fish populations of the river. The return of these populations to natural levels would be a benefit of ecosystem restoration, not an impact.

Section 5.2.4, Page 5-11.

CI-130 — We have examined this DEIS and the submittals of Applicant, and we agree with Commission's staff (cf. p. 4-50), the Washington Department of Wildlife, and the National Park Service that Applicant's wildlife plan provides minimal habitat improvement. We also agree with the WDW and NPS that the staff-proposed improvements provide only some improvement. It is incorrect to say, as the DEIS does, that "important protection and habitat improvement for most wildlife species" is provided. "Some" improvement would be accurate. Furthermore, the plan provides nothing for Olympic National Park, the most seriously aggrieved area.

The benefits of habitat restoration for wildlife under the dam removal alternative are too tersely described. The range of benefiting wildlife is quite large, including both those animals that would directly benefit (including not only the eagles but bear, mustelids, cougar, raccoon, etc.) and those that would indirectly benefit, such as elk (through the fertilization of the ground by the salmon carcasses, leading to more extensive willow growth).

Section 5.2.5, Page 5-11.

CI-131 — The Applicant's proposal would perpetuate the harmful, inappropriate (and for Glines Canyon Project) illegal use of national park, international biosphere reserve, and world heritage site land for hydroelectric power generation.

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CI-128: Comment noted. Section 3.3.3 states that turbidity values exceeding 70 NTU have been observed in the river under existing conditions. However, turbidity levels expected in the river under the dam removal alternatives would reach values many times the highest values currently observed.

CI-129: The staff believes this statement is valid. The reduction of these desirable stocks is an impact. The question of whether this is a "natural" situation does need to be addressed here.

CI-130: Section 5.2.4 has been changed to reflect these comments. See responses DOI-244 and DOI-245.

CI-131: In evaluating potential changes to existing projects, the Commission adopts a forward-looking approach, using present conditions as a baseline and concentrating on current resource needs and opportunities for project improvement. This approach allows for a look at reasonable opportunities for improvement. The Olympic National Park enabling legislation recognized the existence of the Glines Canyon Project as the boundaries were established.

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Sections 5.2.6 and 5.2.7, Page 5-12.

CI-132 There are other, better, and more appropriate flat-water boating opportunities available at other local lakes.

CI-133 As noted above (Sections 2.2.2.1. and 2.2.2.3.), most increased boat launch developments in the park would not be appropriate or allowable.

CI-134 **Section 5.2.7, Page 5-12.**

Most viewers, knowing that the dams were being removed and the land being reforested in order to restore the park and its ecosystem, would not consider the regrowing forest to be "an adverse [aesthetic] effect," rather they would be interested and intrigued by the sight. The "blue waters of Lake Mills" are known to be a hydroelectric reservoir, for most of the year they are ringed by a starkly exposed, barren drawdown zone, and are considered an intrusion and are generally shunned.

Section 5.2.8, Pages 5-12 to 5-13.

CI-135 The economic fortunes of the Lower Elwha Klallam Tribe would be markedly increased if their treaty rights to fish and shellfish weren't being effectively abrogated by these two dams, and would take a notable upturn if the dams were removed and the fish restored.

CI-136 As the agencies have made clear, there are state and federal programs to provide payments in lieu of taxes. As we and the agencies and tribes have emphasized, this is a matter that would enter into the allocation of costs and responsibility in a negotiated settlement. Both of these points should be acknowledged and incorporated into this discussion.

Section 5.2.9, Page 5-14.

CI-137 Once a property that is eligible for, or is listed on, the National Register has been documented to HABS/HAER standards, it may be modified or removed to meet overall objectives. There are certainly other examples of hydroelectric dams of these types and period, and the removal of these dams after documentation would be a reasonable approach.

CI-138 Surprisingly, the discussion does not acknowledge the tribal creation site at the lower dam, nor does it note that removal of that dam would contribute to the restoration of the integrity of this important religious and cultural site.

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CI-132: Section 4.2.6.2 indicates that there are other boating opportunities available on the Olympic Peninsula.

CI-133: See response CI-37.

CI-134: See response CI-98.

CI-135: Comment noted.

CI-136: Reference to in-lieu tax payments has been added to Section 5.2.8.

CI-137: See response DOI-112.

CI-138: See response EKT-2.

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Section 5.2.10, Page 5-14.

Once again, the DEIS discussion is flawed by the application of regional generalizations to this situation.

CI-139 As was noted above, coal-fired thermal plants will not be used to provide replacement power, and a discussion of their impacts is not appropriate to the matter at hand.

We have identified replacement power alternatives that would have a low level of impacts, especially in comparison with the massive cumulative impacts, past, present and future, of retaining the dams.

CI-140 The dams are not important to voltage stability in the area. The periods when there is a threat of voltage collapse in western Washington are during frigid "Siberian Express" cold snaps in the winter. During these periods the river inflow declines precipitously, and the dams are generating at minimal levels, if at all. The projects are simply not available at the very time they would be most useful for voltage support. The records of such events in the last several years show this relationship. Furthermore, BPA has recently found that maintaining voltage stability in the Port Angeles area is not a major problem.

CI-141 Section 5.3, Page 5-15.

We are aware that the Pacific Fishery Management Council has determined that only the dam removal alternative is consistent with the Fishery Management Plan for Commercial and Recreational Salmon Fisheries. Contrary to the statements in the DEIS, the dam retention alternative would be inconsistent with the Plan. The PFMC is the lawful agency for making this determination.

Table 5-5, Pages 5-16 to 5-20.

CI-142 There are various inaccuracies in the table, most of which are noted above and represented again in the table. For example, the terrestrial resources discussion for the Applicant's proposal is overstated, as is noted above. The Applicant's proposal will provide little or no chance of benefitting wildlife that use mature and ancient forest communities; in contrast, the dam removal alternative will have excellent benefits over time from the restoration of the low-elevation forest, riparian, wetland, and riverine communities.

The table also omits such things as movement gravel and large organic debris (good to excellent in the dam removal alternative, poor to none in the Applicant's proposal), consideration of the restoration of the integrity of the Olympic National Park, the

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CI-139: The loss of the hydroelectric generation would cause conservation and generating resources to be called for sooner than would otherwise be the case. Since the supply of lower cost, environmentally benign resources is limited, advancement of resource timing would eventually accelerate the need for higher cost, environmentally damaging resources.

CI-140: Records available to the staff show low Elwha River flows occurring in September, not mid-winter. BPA, in their DEIS comments, did not take exception to the characterization of the area's voltage stability situation nor to the small effect the loss of Elwha and Glines Canyon would have on voltage stability.

The derivation of the fish facilities and restoration costs is presented in Appendix A.

CI-141: See response CI-84.

CI-142: Table 5-5 has been revised to accurately reflect the conclusions reached in Section 4. The table still reflects the staff's viewpoint, which will not always agree with the commentor's opinion.

World Heritage Site, and International Biosphere Reserve, or of the tribal creation site and other tribal cultural concerns.

Ecosystem restoration is submerged and parceled out over several areas.

CI-142 cont'd Tribal treaty rights do not receive consideration in this table.

The table misrepresents the Applicant's recreational measures, which are largely inappropriate and unacceptable. The resident trout population reduction is represented as a negative effect, when in reality it is a benefit to return the population to its natural level in a naturally functioning ecosystem. The silly discussion regarding the aesthetics of the dam removal alternative is again inflicted upon the reader in this table.

Table 5-6, Page 5-21.

CI-143 Table 5-6 shows that the removal of both dams is the only alternative that meets and is fully consistent with all state and federal comprehensive plans as per Federal Power Act Section 10(a)(2)(A). This is a major point in its favor, and should be prominently noted and discussed in the final EIS. The one inconsistency, with the County Shoreline Master Program, consists of a need for an amendment or variance to allow the sediment control work to proceed in the Elwha Dam reservoir area.

As was noted above, the Applicant's Dam Retention Proposal is inconsistent with the Olympic National Park Plan, the Fishery Management Plan, the WDF Hydroelectric Project Assessment Guidelines, and is partly inconsistent with the WDW Strategies for Washington's Wildlife. It is only consistent with SCORP and with several plans that were developed around the existing projects.

Section 5.3, Page 5-22.

CI-144 The National Park Service has determined that only the removal of the two dams is consistent with Olympic National Park plans.

Table 5-7, Page 5-23.

CI-145 As noted above, generation foregone is not a "cost" of the alternative to remove both dams, for there is no "right" to that generation: it is solely at the discretion of the federal government whether or not to grant any license anywhere. Furthermore, the generation at both dams is now being produced illegally, the upper dam being inherently illegal, the lower dam has been illegally operating without a license for 13-23 years.

CI-143: Comment noted; see response DOI-256.

CI-144: Comment noted.

CI-145: Refer to responses CI-42 and CI-44.

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CI-145 cont'd The table should be corrected to reflect this by removing this column.

This table and the associated discussion omit consideration of a number of costs, including the Ediz Hook costs (savings in the case of dam removal). Costs of mitigation for shellfish impacts, and for providing for gravel movement and large organic debris are nowhere to be found. These cannot be ignored, and would be costly to address with the dams in place.

Operation of Glines Canyon would likely be constrained to run of river, not the current regime. There are matters such as screens, spill, monitoring, responsibility for passage success and fish rearing success that are not factored into the analysis.

The table has no consideration of nondevelopmental costs and environmental costs and benefits. The most notorious aspect of these 2 dams has been the more than 70 years of subsidized power production through the externalization of costs to the environment.

The table omits consideration of cumulative impacts of the projects, and the accumulated impacts to the tribal fisheries. These costs, both in their own right and considering the formidable legal costs, would provide some indication of the vast environmental costs incurred by these dams and which would be further incurred by a dam retention alternative.

Section 5.5, Page 5-24.

CI-146 We are pleased to see the recognition that the Commission may order the Licensee to assume the full responsibility for the costs of implementing the Commission's decision. This is in keeping with the language of the Federal Power Act and the absence of a vested right to power production or even occupancy of the waterway.

Section 5.6

The FERC staff's preliminary findings that appear on pages 5-24 through 5-26 of the DEIS contain a number of inconsistencies or inaccuracies in the current text.

CI-147 Finding #1 states that the objectives of anadromous fish and ecological restoration and of hydropower generation are "for the most part" mutually exclusive. In the final document, FERC should drop the phrase "for the most part." As the DEIS properly notes in the second sentence and throughout the analysis, our choice is clear -- fish and a natural national park, or

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CI-146: Comment noted.

CI-147: The referenced text has been deleted.

hydropower. There is no middle ground.

CI-148 Finding #2 argues that the license applicant's proposal "would result in meaningful improvement over current conditions with respect to both fish and wildlife." The applicant's mitigation proposal offers no "meaningful" improvement. The Elwha has no anadromous fish above the Elwha dam; fair or better prospects for restoration of just 4 out of 10 species will not wash. Moreover, Tables 4-14 and 4-21 (pages 4-66 and 4-134) clearly indicate that the numbers of fish will climb much higher if the dams are removed. Due to depletion of salmon runs, the entire Elwha watershed has lost numerous mammal and bird species, including black bears and bald eagles; wildlife mitigation on a scant 897 acres owned by the applicant is worse than insufficient.

CI-149 In finding #3, the DEIS reads, "The applicant's proposal for dam retention can be improved only marginally." As a sign of improvements already stipulated for a new operating license, FERC cites modifications of the Elwha Dam fish ladder, and the requirement of conventional screens on the project if the proposed Eicher screens fail. Regrettably, FERC has ignored important, but expensive, improvements in juvenile passage at the Glines Canyon project. The DEIS text at pages 4-35 through 4-38 clearly shows the efficacy in greater spill or in by-pass screens. FERC has decided to further test the former, and to reject the latter due to cost. Similarly, FERC might require the Applicant to spread gravel and sand below Elwha Dam in order to replenish depleted spawning beds for pink and chum salmon. FERC has apparently ignored this mitigation measure also due to cost.

In finding #4, FERC states that removal of both dams "would be associated with extremely high costs, technical challenges of a high order, and very substantial adverse impacts during and immediately after removal." This statement is a gross exaggeration of the facts as presented in the DEIS.

CI-150 Finding #4 proceeds to estimate the total cost of dam removal at $245 million -- most of which includes the value of lost generation. This is inappropriate. According to the analysis in the DEIS, these dams have flunked the test of the marketplace; they cannot compete with power delivered by the regional BPA at prevailing rates. When a service station goes out of business, we don't include in the cost of its demolition the value of future gasoline sales. We pay the wrecking crew to raze the place, and sell gas at a new competitive station down the street. The same is true for hydropower dams. Environmental groups have identified opportunities to capture 15-20 megawatts of cost-effective conservation at the Daishowa mill which qualifies for BPA funding according to a letter from the agency to Rep. Al Swift last fall; this represents a cheaper power supply than the dams' output, and it doesn't kill fish. Foregone generation might represent an impact of dam removal, but it is NOT a cost.

CI-148: The referenced text has been deleted.

CI-149: Comment noted.

CI-150: The referenced text has been revised.

The comment fails to acknowledge that utilization of a low-cost conservation resource to replace the hydroelectric energy means that the conservation resource is no longer available to meet other regional loads. This, in turn, will cause higher cost, environmentally adverse resources to be called upon sooner than would otherwise be the case.

Section 4.2 has been augmented to describe anticipated adverse aquatic effects during dam removal.

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Moreover, the DEIS provides no estimate, even a minimum one, of the economic benefits of fish restoration under the dam removal alternative. Therefore, as the DEIS states from the executive summary onward, the capital cost of dam removal is $64.3 million, and that is the only relevant price tag under consideration.

Then finding #4 observes that "technical uncertainties exist" around the "lower impact approaches to dam removal." This merely overstates the obvious -- that engineers don't know with entire precision the exact problems in any project until they turn over some dirt and move some concrete.

CI-150 cont'd

In the final paragraph of finding #4, FERC states, "High silt loads would reduce production of fish stocks in the middle and lower river reaches and adversely affect municipal, industrial, and fish-rearing channel water supplies." This sentence is not supported by the analysis in the DEIS. The document contains no accounting of any fish losses during dam removal; the JFWA has reported that experience from the eruption of Mt. St. Helens leads to optimism regarding fish restoration potential even in the face of short-term siltation effects. The study of dam removal clearly indicates that water supplies can be fully protected through filtration and/or other treatment. Finally, finding #4 notes "increased potential for flood damage," but does not explain that any flooding would be local and not exceed 2 feet.

Particularly objectionable about the text of finding #4 is its failure to note the clear economic gains to the nation in fish and natural resources that flow from dam removal. Along these lines, the DEIS should take into account the loss to the public of fish during the 80 years that the Elwha Dam has blocked passage. As currently stated, finding #4 emphasizes only the alleged gloom and none of the proven boon in dam removal.

CI-151

Finding #5 submits that, if the dams remain in place, "society will need to be willing to accept less than full exploitation of the river's anadromous fish production potential." If the Elwha River dams receive a new operating license, what society must accept is the inevitable extinction of more native stocks of the river's anadromous fish species. A new license would seal the fate of the pink salmon, which may have once numbered in excess of 250,000 adults during their spawning run -- now driven to the brink of permanent loss. But the DEIS finds that, if the dams are removed, society has a "good" chance of seeing the pinks restored to their original glorious numbers. Again, Tables 4-14 and 4-21 (pages 4-66 and 4-134) clearly show that dam removal would provide for considerably larger numbers of fish. Moreover, if Glines Canyon Dam remains in the river, society must accept the continued intrusion of a hydroelectric facility within Olympic National Park -- an international biosphere reserve.

CI-151: Comment noted.

CI-152 Finding #6 that "intermediate alternatives involving removal of only one dam ... do exist" is inconsistent with the first finding that the resource objectives are mutually exclusive. Indeed, the DEIS admits in the next sentences that removal of only the Elwha Dam would not provide for restoration of Olympic National Park due to the continuing intrusion of the Glines Canyon project. In the final document, FERC should reject any intermediate alternatives as simply unworkable and unresponsive to the resource objectives.

In conclusion, the preliminary findings as stated in the DEIS are inappropriate or inaccurate. We urge the Commission to correct the text in the final document, and to choose as the preferred alternative removal of the Elwha River dams. Removal of the dams is the only way to restore the legendary fish runs of the river, and the ecological integrity of Olympic National Park.

CONCLUSION

For the most part, we regard the DEIS as a solid beginning toward preparing a meaningful final EIS that will serve its purpose by assisting decisionmakers and the public reach an informed decision on the issues raised in this proceeding. However, the foregoing suggestions and comments must be accounted for in the final document.

Respectfully submitted,

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Attorney for Friends of the Earth, Olympic Park Associates, Seattle Audubon Society, and Sierra Club

June 27, 1991

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CI-152: The first finding has been revised, thereby eliminating any inconsistency. Position in favor of dam removal is noted.

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STAFF REPORT

COMMENTS OF CORP OF ENGINEERS

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-2255

REPLY TO ATTENTION OF

APR 24 1991

Hydrology and Hydraulics Branch

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, DC 20426

Dear Ms. Cashell:

The Seattle District, Corps of Engineers (NPS), has reviewed the draft Environmental Impact Statement (DEIS) for the Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) hydroelectric projects. Our review indicates that the dam removal alternatives will affect operation of Corps of Engineers projects. This response has also been furnished to the Corps of Engineers North Pacific Division Commander.

Our major comments regard the document's presentation of the impact of dam removal alternatives on the recently completed Federal flood control project located on the Lower Elwha River and the Ediz Hook project. Specific comments relative to these issues are enclosed. We have furnished numerous other staff review comments on other aspects of the DEIS to the State of Washington Department of Ecology (DOE) in a response to their request for an NPS review of the DEIS. Mr. Frank Urabeck, Chief of Plan Formulation (telephone 206-764-3408), is the point of contact for a complete list of comments furnished the DOE.

COE-1 Information presented in the DEIS indicates that the sedimentation impacts of the alternatives involving removal of both dams will reduce the level of protection provided by the Lower Elwha River federal levee project from a 200-yr frequency to about a 20-yr frequency. However, because downstream flooding information under the dam removal alternatives is inconspicuously located and somewhat contradictory in various portions of the document, it may be easily overlooked. The EIS must clearly discuss this issue in a stand-alone section of the document per comments furnished to the FERC by our letter dated 19 January 1990.

The DEIS cost estimate of measures intended to retain the Federal projects' current level of protection must be reevaluated considering the following:

COE-2 a. Insufficient information is contained in the DEIS to form an independent assessment regarding the success of stabilizing the reservoir sediment deposits during and after dam removal

RESPONSES TO CORPS OF ENGINEERS

COE-1: Under the dam removal alternative, the Commission staff's analysis indicates flood protection would be reduced at the lower Elwha levee because of the return of the natural upstream sediment supply. The Elwha HEC-6 model run 40 indicates the estimated 200-year recurrence interval flood of 56,000 cfs would increase flood levels 1 to 2 feet (Table C-1, Appendix C). The staff agrees with the Corps that sediment transport assessments have a high degree of uncertainty. Based on the staff assessment and the Lower Elwha Klallam Tribe study (Summit, 1991), large amounts of suspended silt and clay would be transported downstream during the removal process. It would be difficult to control the erosion of silts that are not deliberately washed downstream. However, the staff believes that channel aggradation caused from erosion of the lake bottom sediments would be minor because (1) the lake bottom silts rest on broad flat alluvial terraces and the new (and original) river channel would be 10 to 20 feet below these terraces; and (2) extensive erosion control measures proposed for the removal alternatives (Appendix A).

If large amounts of sand and gravel from the reservoir delta sediments were released downstream, significant channel aggradation would occur. However, the delta sands would be easy to stabilize in the reservoirs because of the controlled drawdown, extensive dredging proposed in the removal alternative (Appendix A), and the sands would be on existing stable, broad, and flat alluvial terraces.

Cost estimates to upgrade the levee have been included in the cost analysis (Appendix A, Table A-28). Armoring costs were based on 10 feet of 2-foot rock along the full length of the levee.

COE-2: Channel changes presented in Appendix A, Table A-28 are based on erosion of the channel sediments with no dredging. It is therefore a fairly extreme case compared to the proposed removal plan with extensive dredging of the delta sands.

COMMENTS OF CORP OF ENGINEERS

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COE-2 cont'd alternatives. Information regarding the uncertainties of achieving the assumed stabilization and risks associated with the uncertainties need to be assessed and included in the DEIS. If sediment releases during and after dam removal activities are greater than assumed, such activity would affect aggradation and water levels in the Lower Elwha River.

COE-3 b. The effect of the loss of storage resulting from dam removal on frequency of discharges on the Lower Elwha River needs to be addressed and included in the DEIS analyses of flooding impacts as per our 19 January 1990 letter to FERC.

COE-4 c. Although the basic conclusion made in the DEIS regarding the potential for channel aggradation in the Lower Elwha River is reasonable, the accuracy of the results of the HEC-6 numerical sediment transport model accomplished for the document is open to question. Even with the most detailed analysis and basic data available, such analyses inherently contain uncertainties. Based on the limited data presented in the document, the analysis accomplished may have a relatively high degree of uncertainty due to such considerations as the limited basic data available to calibrate, verify and operate the model and the duration of hydrologic events simulated. The DEIS must address the computed results' sensitivity to all modeling uncertainties and must include the sensitivity analyses in the cost evaluation of the dam removal alternatives. Because uncertainties in sediment processes will exist regardless of the detail of the analysis, a sediment monitoring program which includes annual surveys of the channel at monumented locations, annual evaluation of channel capacity using that resurveyed data, and possible maintenance dredging as required must be included in the cost analysis of the dam removal alternatives.

COE-5 d. The DEIS concludes that channel instability will occur as a result of sedimentation activities under the dam removal alternatives. The existing Federal flood control levee is not designed for direct flow velocities. The DEIS must address the potential for channel instability to affect the Federal flood control project and, if so, discuss the measures and costs required to protect the levee against flow due to channel migration.

The DEIS should also address the issue of responsibility for payment of any modifications to the Federal project required to maintain the designed level of protection.

COE-6 We request that a revised or supplemental draft EIS be prepared for public review once the FERC staff's preferred alternative is selected. The supplement must incorporate the

RESPONSES TO CORPS OF ENGINEERS

COE-3: The Glines Canyon and Elwha dams have not been operated historically to minimize flood peaks. Operations at normal pool levels provide negligible surcharge flood storage because of the modest surface area of each of the reservoirs. The surface areas of the Glines Canyon and Elwha reservoirs are approximately 415 and 267 acres, respectively. Thus, a negligible reduction in flood storage would be likely with dam removal.

Two significant factors for evaluating potential peak flow attenuation are (1) the duration of any peak flow, and (2) the corresponding inflow hydrograph and any assumed operation of the spillway gates. In the case of Glines Canyon, frequently recurring floods in the 1- to 10-year range were found to result in an equilibrium of inflow and outflow within 6 hours or less. The equilibrium time for non-gated spillway flows to equal inflows was found to decline with inflows of decreasing frequency. The greater the inflow, the sooner the equilibrium with outflow was achieved. Extremely high flood flows thus surcharge the reservoir quickly to the point where outflows essentially equal inflows.

Under current project operations, with reservoirs typically maintained at the normal pool elevations, greatest attenuation would result from allowing discharges only over the non-gated spillway sections. This would ultimately result in the greatest flood storage surcharge. Operation of spillway gates could theoretically magnify the instantaneous peak flow.

The staff therefore judged that attenuation of flood flows is generally negligible and that significant peak flow attenuation occurs only with short duration precipitation; thus, the project's flood attenuation potential is most likely to apply to only the relatively small, frequent flood peaks which cause no downstream damage, and dam removal would cause little change in flooding impacts of peak flows.

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COE-6 cont'd above comments and cost information. A clear description of the impacts and costs of all alternatives must be clearly presented in the DEIS in order that the decision regarding the best beneficial use of the Elwha River resource is based on all available information.

COE-7 We again reiterate that a Department of the Army permit under Section 404 of the Clean Water Act is required for the discharge of dredged or fill material in the Elwha River. Section 404 permit applications should be submitted to the Seattle District, COE, at least 6 months prior to initiation of any construction.

Sincerely,

Lawrence O. Merkle

Lawrence O. Merkle, P.E.
Chief, Hydrology and Hydraulics Branch

COE-4: The Corps comments related to uncertainties are relevant. A relatively extreme case such as the erosion of sediments from the reservoir during controlled drawdown has been presented in Appendix A (Run 40) to show potential downstream channel conditions. Suspended sediment concentrations and channel changes would be less under alternatives where the new channel areas are partially or fully dredged.

For cost estimates of the removal plan it is assumed that all the channel sediments are dredged and moved to storage areas within the reservoirs, therefore allowing for numerous alternatives within the existing cost framework for the final removal plan.

A monitoring plan during removal and for 4 to 6 years thereafter has been added to the staff recommendations (Chapter 4). The final format of a monitoring program would be developed during final design.

COE-5: Because of the migration potential, the staff has now included measures for raising and protecting the levee in the dam removal plans (Section 4.2.1.3).

COE-6: The staff does not see a need for a supplemental DEIS. The DEIS addresses the range of reasonable alternatives and all issues identified during the EIS scoping process as potentially significant. The FEIS addresses these same alternatives and issues, but also benefits from the comments received on the DEIS.

COE-7: The staff notes that a Department of the Army permit under Section 404 of the Clean Water Act is required for the discharge of dredged or fill material in the Elwha River, and that such application should be filed with the Seattle District at least 6 months prior to initiation of any construction.

COMMENTS OF CORP OF ENGINEERS

Elwha and Glines Canyon Dams FERC DEIS

Comments Regarding Corps Projects

COE-8

1. Impacts on flooding

Reduced flood protection levels provided by, and damage to, the COE-constructed flood control levee on the lower Elwha River due to changes in the hydraulic/sedimentation regime are very real potential consequences of the dam removal alternatives. The set-back levee project was recently completed at a total investment of approximately $1.4 million. The effects of the dam removal alternatives on flooding potential in the lower valley, and potential channel migration into the levee, as a result of river morphology changes is not adequately addressed in the DEIS. A separate, stand-alone section discussing effects of the various alternatives on downstream flooding, as discussed in our 19 January 1990 letter, is needed to clearly illustrate this aspect of the alternatives.

COE-9

2. Impacts on flooding.

In the discussion on the 'removal of both dams' alternative on page 4-83, the report indicates the flood control protection provided by the federally-constructed levee may be reduced from 56,000 cfs to 30,000 cfs which corresponds to a reduction from a 200-year frequency (.5% annual exceedance frequency protection level to approximately a 20-year frequency (5% annual exceedance frequency) level. This reduction in flood protection may be understated as only natural-condition sedimentation processes, not potential slugs of sediment from dam removal activities, were evaluated in the numerical modeling accomplished for the DEIS. The following comments discuss the need to better define the potential impacts of dam removal on lower Elwha River flooding, and the costs associated with potential mitigation for lost flood protection.

RESPONSES TO CORPS OF ENGINEERS

COE-8: Because the upstream projects historically have not been operated for flood control and none of the alternatives call for flood control operations, analysis of the changes assume minimal flood storage in the upstream reservoirs. Because of this, negligible attenuation in peak flows for the largest floods occurs. Thus, no substantive changes would occur to peak flows for the largest floods under the removal alternative. The smaller floods would result in greater variation in flow, but at these lower levels the change would not be great enough to change a given flood to one of generally greater severity. Greater differences would likely result from deposition and a raising of the river elevation. Because of this, levee raising and protection has now been included as an element in the dam removal alternatives (Section 4.2.1.3).

COE-9: Dam removal alternatives have been revised to include modifications and the associated costs to maintain the current level of protection provided by the flood control levee (Section 4.2.1.3).

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COMMENTS OF CORP OF ENGINEERS

COE-10 a. If an alternative involving the removal of one or both dams is eventually advanced as a plan of action, considerable refinement to the sedimentation analysis would be necessary to raise it to level sufficient to accomplish detailed design data (see our comment #3).

COE-11 b. All alternatives that include removal of one or both dams must include a cost item for a channel stability/conveyance monitoring program for the lower Elwha River channel adjacent to the existing levee running from approximately RM 0.0 to RM 1.7. Monitoring program guidelines for use in preliminary cost estimates are as follows:

(1) The present-day channel would be surveyed at cross sections, permanently monumented for future reference and retrieval, located approximately 1000 feet apart (total of eight) between RM 0.0 and RM 1.7.

(2) The cross sections are to be surveyed prior to initiating upstream construction activities, re-surveyed yearly during the construction period and near-term post-dam removal period, re-surveyed every three to five years, or as needed, thereafter until sediment conditions have stabilized to a nearly natural condition.

(3) The surveys are to be of sufficient detail that accurate detection of changes in channel capacity can be made.

Additional monitoring of the middle and upper reaches may also be desirable for establishing sediment inflow and channel storage information that may be useful as the project progresses.

COE-12 c. Impacts on flooding. For the alternatives that include removal of one or both dams, a potential measure to mitigate for reduced channel capacity in the lower Elwha River is to maintain present day flood protection levels by levee height increases and/or dredging if conveyance loss due to sediment deposition exceeds that determined from numerical modeling techniques. Only the costs associated with levee height increases were presented in the DEIS. The EIS should discuss the possibility of the need for possible maintenance dredging in addition to the stated increased levee height and include such costs in the EIS.

COE-13 d. Pg. 4-83. In connection with comment 1c, the

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COE-10: Comment noted. It has been assumed that additional studies would be performed during the final design stage of any dam removal alternative.

COE-11: Given the overall scale and costs of any dam removal alternative and attendant considerations, the cost for future monitoring is judged to be relatively insignificant, particularly with respect to the ultimate decision. Such an assessment would be valuable and is recommended as part of the mitigation package under the dam removal alternative (Section 4.2.1.3).

COE-12: The results of the numerical model provide the best available assessment of what would occur in any removal alternative. Mitigation included in the dam removal alternative is commensurate with the results of the model. Continuing costs for sediment control measures have been included, and could be assumed to represent a degree of future dredging activity, if necessary.

COE-13: Comment noted; see response COE-1.

COE-13 cont'd

document needs to expand its discussions on the increased potential for lateral migration of the lower river channel into the flood protection levee. Clarify whether the cost of structural measures necessary to preserve the integrity of the levee against lateral migration of the main channel are included in the cost of the dam removal alternatives reported in the DEIS. If these costs are not included in the DEIS, the total cost of the dam removal alternative presented in the EIS must be revised to include plans and associated costs to mitigate for potential damage to the Corps constructed levee induced by lateral channel movement.

COE-14

3. Impacts on flooding. A detailed technical review of the sedimentation analysis was not possible given the limited data in the report. Analysis accomplished for the DEIS shows that the channel adjacent to the levee is a deposition reach and gives, for the 'both dams removed' alternative, values for potentially necessary levee height increases (p. 4-83) as a result of changed sedimentation process. These potential increases do not appear to be unreasonable, however, the report should clearly state that these predicted values are initial estimates. The discussion in the document needs to include the degree of confidence in the computed values, and give some indication of the range of potential flood level increases rather than reporting increases as one value. Potential sediment responses in the lower Elwha due to dam removal depend on factors such as the degree of success of reservoir sediment stabilization measures and whether large or small flood events occur during the construction and near-term post-dam removal periods. Uncertainty also exists with the reported values due to modelling limitations and uncertainty in input parameters (i.e. sediment yield uncertainty, calibrated for with-reservoir condition but ran for w/o reservoir condition, lack of calibration for sediment processes in the lower reach, only 20-years of hydrology

COE-14: **Comment noted.**

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COMMENTS OF CORP OF ENGINEERS

COE-14 cont'd			simulated but economic life of levee project is 100 years, modeling does not include potential sediment slugs from construction activities). These uncertainties, and their potential impact on the predicted flood level changes and mitigation costs, should be discussed along with presentation of the results in the EIS.
COE-15	4.	Pgs 4-82 and 4-83	Include with discussion of potential water surface elevation rises near the COE constructed levee a flood profile graph showing existing and potentially changed flood profiles developed with respect to the discussion in comment 3 and using a scale that clearly shows potential changes. The text alone in this section seems to, without careful reading, contradict itself regarding increases in flood profiles and necessary increases in levee height.
COE-16	5.	Glines Canyon removal with the retention of Elwha Dam	For the 'Glines Canyon removal with retention of Elwha' alternative, discuss the potential effects on flood levels and the federally constructed levee in the lower Elwha River after Lake Aldwell fills with sediment. Discuss potential mitigation costs associated with these effects.
COE-17	6.	Pgs 4-83, para 3	Include the exceedance frequencies corresponding to the flows listed within this paragraph (i.e. 'Flood protection here would be reduced from 56,000 cfs (.5% annual exceedance frequency, or 200-year frequency flood) to about 30,000 cfs (5% annual exceedance frequency, or 20-year frequency flood)).'
COE-18	7.	Pgs 4-74 and 4-78	Remove references to "stable floodway". A floodway, as defined by FEMA and the Corps, is not a part of this alternative. Modify references to "stable channel" (e.g. near bottom p. 4-

RESPONSES TO CORPS OF ENGINEERS

COE-15: The text (Sections 4.2.1.2 and 4.2.1.3) has been modified to clarify the discussion of sediment deposition and increase in levee height necessary. A figure has not been included because the text is judged to provide adequate explanation.

COE-16: Under the ultimate condition of Lake Aldwell being filled with sediment, flood level increases would be essentially the same as under the removal of both dams alternative. Channel aggradation would not be a consideration, however. Refer to response COE-1 for a discussion of this condition.

COE-17: Plans now call for levee improvements that would maintain the original degree of protection (Sections 4.2.1.2 and 4.2.1.3).

COE-18: Section 4.2.1 has been modified to reflect Corps comments. Erosion and dredging of lake bottom sediments during controlled reservoir drawdown would quickly expose the old river channel. The old river channel consists of a main boulder-bedded channel incised 10 to 20 feet into the broad alluvial valley fill in the reservoirs. A relatively natural channel would develop in an estimated 4 to 6 years following dam removal.

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COE-18 cont'd

78) that conflict with descriptions of channel instability (p. 4-83) and incorrectly imply the strong likelihood of pre-designing a channel through the lake deposits that will quickly stabilize and remain stable through all flow conditions. Such assumptions may be overly optimistic and have a direct impact on both costs reported to accomplish such intended stabilization and costs associated with aggradation in the lower Elwha River.

COE-19 — 8. Pg 4-77 — Remove or modify reference on bottom of this page to clarify that the Corps has not performed an HEC-6 sediment study on the Elwha River.

COE-20 — 9. Construction phase discussions — Clarify in the construction phase discussions of the dam removal alternatives how floods can be passed but not entrain and transport unnaturally high sediment loads out of the reservoirs and down to the lower reach. If, as the report indicates, the natural sediment supply is reduced in the winter, then the potential for degradation in the reservoirs will be higher with the sediment-starved, high winter flows.

COE-21 — 10. Construction impacts — Clarify and expand on the proposed plan for preventing sheet, rill, and bank erosion during construction and near-term post-dam periods in discussions of dam removal alternatives. Discuss the range of expected success of such plans and the impact that success (or lack of success) would have on downstream sedimentation processes and resultant flooding conditions.

COE-22 — 11. Long-term impacts — Include the monitoring program, channel capacity and levee protection recommendations, and potential flood damage increases described above in the discussion of long-term impacts.

COE-23 — 12. Pg 4-136 — Under 'Other Effects', remove portion of

RESPONSES TO CORPS OF ENGINEERS

COE-19: The text has been changed in Section 4.2.1.

COE-20: In the removal alternative, assumed by the staff for impacts and cost assessment, floods would erode undredged delta sands and lake bottom sediments during the construction period. Until the dams are fully removed, the sand and coarser material would redeposit in the partial reservoirs whereas the silts and clays would mostly wash downstream.

COE-21: The text has been expanded in Section 4.2.1 and Appendix A.

COE-22: Sections 4.2.1.2 and 4.2.1.3 have been revised to address monitoring and levee protection. With the recommended levee protection, there would be no increase in flood damage.

COE-23: The text has been revised in Section 4.2.8.2 to indicate that any increase in flooding potential would be mitigated by levee improvements.

COMMENTS OF CORP OF ENGINEERS

COE-23 cont'd

sentence saying 'threat of flooding would be slightly greater...' and replace with 'preliminary studies show that sediment aggradation could result in a significant reduction in the protection provided by the lower Elwha levee, i.e., from the existing .5% annual exceedance frequency leval (200-year frequency flood) to a 5% exceedance frequency level (20-year frequency flood)' or some comparable statement, using frequency terms, that clearly defines the reduction in flood protection at the levee. As part of the same paragraph, add a statement saying that as part of the project, sediment aggradation in the lower Elwha River will be monitored and that mitigation measures (i.e. dredging, levee raising, protection from lateral channel migration, and/or compensation for increased flood damages) will be necessary.

COE-24

13. Pg C-3 Para 3 — Eliminate references to freeboard. Discuss loss of conveyance in terms of water surface elevation changes, Q changes, or frequency changes.

COE-25

14. Appendix — Include in sedimentation appendix a discussion on the limitations of the sedimentation analysis and address the impacts of potential unnaturally high sediment loads from the reservoir during the construction and near-term post-dam removal periods.

RESPONSES TO CORPS OF ENGINEERS

COE-24: Appendix C has been revised to eliminate references to freeboard.

COE-25: Comment noted. The staff considers flood storage in both reservoirs to be insignificant.

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COMMENTS OF CORP OF ENGINEERS

COE-26

15. Comments on flooding & flooding impacts.

Subsections entitled "flooding" within Chapter 3 and "flooding impacts" within Chapter 4 should be created to discuss impacts of dam removal on flood control along the Elwha River. Discussions on flood control impacts from dam removal are scattered in several subsections of Chapter 4. These discussions should be consolidated and given more emphasis in the DEIS because the Elwha River flooding problem is significant. Within this new flooding impacts subsection, both of the following potential problems should be discussed:

Increased sediment load in the river from dam removal will affect the protection level provided by downstream levees, and to a very minor extent, dam removal will also increase downstream discharges due to removal of the modest alternating effects of reservoir storage.

COE-27

16. General

The Seattle District 19 January 1990 letter to FERC provided comments on the concerns related to dam licensing or dam removal. Several of these concerns do not appear to have been addressed in the subject EIS. A revised DEIS should address all Corps concerns.

COE-28

17. p. 5-12, para. 5.2.8

Socioeconomic effects should include a discussion on loss of flood protection if sediment loads from dam removal are excessive.

COE-29

18. p. 5-15, para. 5.3

Are there any comprehensive flood control plans and responsible agencies that could be included here?

COE-30

19. Comments on retention of Elwha Dam and Glines Canyon Dam alternative

The dam retention alternative whereby only Elwha Dam is removed should address the possibility of offsetting of increased sedimentation and lower flood protection levels by providing reservoir storage for flood control in Glines Canyon Dam. Although past cursory assessments by the Corps and others have indicated that storage in these reservoirs is not sufficient to provide meaningful flood reductions, the

RESPONSES TO CORPS OF ENGINEERS

COE-26: Comment noted. Because of the modest attenuating effects of reservoir storage, the inclusion of the additional flood control improvements, and the persistent potential of flooding, the staff feels that flooding effects are best described as part of the long-term impacts on soils and river morphology and do not require a new section or subsection.

COE-27: The FEIS addresses all potential impacts of significance.

COE-28: Continued flood protection would be assured by raising the existing dikes, a measure that has been added to the dam removal alternative (see text change in Section 4.2.1.3). Thus, any potential adverse socioeconomic effects would be mitigated.

COE-29: No comprehensive flood control plans for the Elwha River Basin have been identified by the Commission.

COE-30: The staff judged that if only Elwha dam were removed, the greatly reduced overall sediment transport would similarly reduce inchannel sediment deposition. Because of this and the minor attenuating capacity of Lake Mills, operations of the Glines Canyon Project for flood control were not investigated.

COMMENTS OF CORP OF ENGINEERS

COE-30 cont'd

addition of downstream levees could change this conclusion. The levees might allow higher dam releases prior to the flood peak, thereby reserving storage space to reduce the peak inflow to the reservoirs. Although this flood control option may not prove to be feasible, options such as this to offset sedimentation impacts should at least be addressed in the EIS.

COE-31

20. Coastal Sediments and the and Ediz Hook discussions - p. 3-18 to 20, 4-243, 4-83 & 4-84, 4-136, 4-163, 5-13 and Table 5-5.

In general, the draft EIS overestimates the importance that the restoration of the Elwha River bedload would have in reducing beach nourishment requirements of Ediz Hook. In most cases, the EIS states that restoration of the bedload would reduce nourishment requirements, which would be true to a degree, but on page 4-84, the EIS goes so far as to say..."Eventually, beach nourishment of the Ediz Hook area would no longer be needed." Even if removal of the waterline bluff protection works (a potentially much more important source) were to take place, we believe artificial nourishment of Ediz Hook would still be required. Restoration of Elwha bedload would affect the near proximity of Angeles Point the most, helping a great deal in reducing erosion just east of the Elwha mouth. The Elwha River sediment quantities included in the EIS are probably much better than any previously estimated quantities; however, these numbers should not be used to, say, calculate a percentage contribution to the littoral drift along Ediz Hook. We do concur with your general statement that any Elwha bedload contribution to Ediz Hook would take a number of years before effects to Ediz Hook would take place. The $100,000/year artificial beach nourishment cost to Ediz Hook is correct.

RESPONSES TO CORPS OF ENGINEERS

COE-31: Comment noted; the text has been changed in Sections 3.2.12, 4.1.1.2, 4.2.1.2, and 4.2.8.2.

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Riddell, Williams, Bullitt & Walkinshaw
LAW OFFICES

HARRY E. GRANT, JR.

June 26, 1991

Ms. Lois D. Cashell
Secretary
Federal Energy Regulatory Commission
825 North Capitol Street N.E.
Washington, D.C. 20426

Re: Comments of Daishowa America Co., Ltd. on Draft Environmental Impact Statement for the Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington

Ladies and Gentlemen:

Enclosed for filing is the original and fourteen copies of the comments of Daishowa America Co., Ltd. ("Daishowa") on certain aspects of the Draft Environmental Impact Statement ("DEIS") (FERC/EIS-0059D-February 1991) for the Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects located near Port Angeles, Washington. These comments are submitted pursuant to the National Environmental Policy Act of 1969 and the pertinent regulations of the Federal Energy Regulatory Commission ("Commission") implementing the National Environmental Policy Act (18 C.F.R. Part 380).

INTRODUCTION

Daishowa is a Washington corporation headquartered in Seattle. It is the owner of the pulp and paper mill ("Port Angeles Mill") located on Ediz Hook in Port Angeles, Washington, which presently uses all of the electric power generated by the Glines Canyon and Elwha Hydroelectric Dams ("Hydro Projects").

Daishowa purchased the Port Angeles Mill in March 1988 from James River II, Inc., the current owner of the Hydro Projects and the licensee in the above-referenced proceeding before the Commission. Pursuant to a Management and Power Supply Agreement with James River II, Daishowa has the right to receive all power generated by the Hydro Projects at cost for an indefinite period. In addition, if the Hydro Projects are successfully licensed by

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James River II in this proceeding, subject to appropriate orders by the Commission, Daishowa has the right to acquire title to the Hydro Projects from James River II. Daishowa is therefore vitally interested in the outcome of these proceedings and the ultimate disposition of the Hydro Projects.

Since acquiring the Port Angeles Mill, Daishowa has committed to investments of over $100 million to make the Mill more competitive including the construction of a $40 million recycled paper facility to convert up to 40% of the mill's capacity to the production of pulp from recycled paper. To sustain these investments and to be able to continue to produce and market directory paper competitively, the Port Angeles Mill requires a stable economic source of electric power comparable to what is presently available from the Hydro Projects.

With approximately 318 employees, the Port Angeles Mill is the second largest private employer in Clallam and Jefferson Counties and contributes substantially to the economy of the Olympic Peninsula each year. In 1990, the Port Angeles Mill paid over $16 million in salaries, wages and benefits (or the equivalent of approximately $52,700 per employee) and contributed nearly $2 million in local sales and property taxes. In addition, in 1990 the Port Angeles Mill spent approximately $2.6 million for oil and hog fuel and nearly $20 million for logs and wood chips to produce directory paper.

There are many substantive issues raised by the DEIS which undoubtedly will be the subject of extensive comments by the applicant, intervenors, and other interested parties. In this letter, Daishowa respectfully offers its comments on the two aspects of the DEIS which are of greatest importance to the viability of the Port Angeles Mill: (i) the economic analysis of the project alternatives considered by the DEIS, and (ii) certain water quality issues, including sediment impacts on industrial water users and flood control concerns posed by dam removal. Based on its own independent studies, as set forth in Exhibits attached to this comment letter, Daishowa believes that the analysis contained in the DEIS with respect to these issues is both deficient and misleading. Further technical work must be performed and these deficiencies corrected before publication of the Final Environmental Impact Statement.

COMMENTS OF DAISHOWA AMERICA COMPANY

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SUMMARY OF COMMENTS

A. Economic Analysis of Project Alternatives

1. Regional Analysis

DAC-1

Section 2.7 of the DEIS purports to be an economic evaluation of the applicant's proposal and the three project alternatives identified by Commission staff. In Section 2.7.2, the DEIS compares the costs of the various alternatives using a "long-term marginal resource comparison," and concludes that the applicant's dam retention proposal would be the "least cost" alternative. That conclusion is based on a "net present value analysis" over a 50-year period, using the Northwest Power Planning Council's "benchmark coal plant" to compute the cost of power generation foregone in the various dam removal alternatives. The 50-year levelized cost of equivalent coal fired generation is stated to be about 96 mills/kwh, in 1996 dollars, or approximately $16.1 million per year.

Using this long-term marginal resource comparison, the DEIS correctly concludes that the Hydro Projects, with appropriate fisheries mitigation per the applicant's dam retention proposal, have substantial value to the region, compared with the other alternatives.

2. Analysis of Value of Power to Port Angeles Mill.

DAC-2

In Section 2.7.3 entitled "Assessment of Daishowa America Mill Power Cost Impacts," the DEIS purports to analyze the value of the power from the Hydro Projects, after mitigation, to the Port Angeles Mill. Incredibly, the DEIS reaches the conclusion (at page 2-40) that ". . . the power costs associated with the applicant's dam retention proposal would be comparable to the price of BPA power (priority firm rate) purchased through Port Angeles City Light." It further states that ". . . the applicant's dam retention plan and the removal of both dams alternative would result in essentially the same overall power cost to the mill . . . ."

The implication of Section 2.7.3 of the DEIS, therefore, is that the Hydro Projects, if licensed with the mitigation improvements proposed by James River II, would have no value to the owner of the dams, or to a user of the power such as the Port Angeles Mill, which currently has the right to receive power from the dams at the cost of production. This inference is incorrect, and it is highly misleading. It is based on questionable assumptions and incomplete analysis.

RESPONSES TO DAISHOWA AMERICA COMPANY

DAC-1: Agreement noted. EIS Section 2.7.2 has been modified to: (1) adopt a shorter period of analysis (30 years) to be consistent with the term of a license, and (2) value the foregone power at the region's avoided cost for a generating resource with a 30-year physical life.

DAC-2: The referenced analysis has been revised (Section 2.7.3).

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Daishowa has retained the nationally recognized public accounting firm of Deloitte & Touche to perform a thorough economic analysis and valuation of the power generating capacity of the Hydro Projects, as licensed in accordance with the applicant's proposal. The results of that analysis are summarized in a report entitled "Review of Cost of Power Analysis in Draft Environmental Impact Statement," dated June 21, 1991, which is attached to this comment letter as Exhibit I. In performing the analysis, Deloitte & Touche attempted to replicate as closely as possible the analytical methodology used in the DEIS, but substituting reasonable assumptions and sound accounting methodology for those elements of the DEIS analysis which Deloitte & Touche considered to be flawed.

In particular, the Deloitte & Touche Report points out that the power cost comparison made in the DEIS is based on a 10-year projection, where the proper period for analysis of a hydroelectric project, as used elsewhere in the DEIS, is 50 years.

DAC-3

Most importantly, the Deloitte & Touche report concludes:

- The net present value (in 1996 dollars) of the difference in the cost of power generated by the Hydro Projects, after fully accounting for the cost of fisheries mitigation contained in the applicant's proposal, over a 50-year term, versus the cost of power purchased from BPA through Port Angeles City Light, is approximately $57.7 million.

- On a levelized basis, the average cost of power from the Hydro Projects over a 50-year term, with fisheries mitigation as proposed by the applicant, would be 114 mills per kwh, while the average cost of purchased power would be 183 mills per kwh. In constant 1996 dollars, the average costs would be 18.4 mills per kwh and 29.5 mills per kwh, respectively.

The conclusions reached in the DEIS regarding the economic importance of the Hydro Projects to the Port Angeles Mill are seriously misleading and inhibit an informed decision by the Commission in this proceeding. The power generated by the Hydro Projects has substantial value, both to the region and to the Port Angeles Mill. Daishowa's decision to purchase the Port Angeles Mill from James River II was based in substantial part on the expectation of a long-term supply of power from these dams being available at cost.

DAC-3: Findings noted. The referenced analysis has been revised (Section 2.7.3).

COMMENTS OF DAISHOWA AMERICA COMPANY

DAC-4 The National Environmental Policy Act requires that socioeconomic factors be adequately considered by the Commission in making a decision of this magnitude. As written, the DEIS does not adequately address these factors.

B. Water Quality

1. Sedimentation Problems Resulting From Dam Removal.

DAC-5 Section 4.2 of the DEIS attempts to address water quality impacts that would occur if the Hydro Projects were removed. That analysis is superficial and incomplete. It does, however, state that total suspended solids (TSS) concentrations in the Elwha River will increase substantially if the Hydro Projects are removed. TSS concentrations of 300-500 mg/l are expected to occur during the "construction" period for dam removal and during winter storms. The DEIS forecasts a dam removal period of 5 years, with adverse water quality impacts continuing for another five years. This conclusion, that adverse water quality impacts will be limited to a ten year period, may be unduly optimistic. A more conservative projection (of adverse water quality impacts over a longer period) would be more appropriate. See Comments of James River II regarding deficiencies in DEIS discussion of dam removal alternative.

Significantly, the DEIS fails to make thorough-going quantitative estimates of TSS concentrations in its discussion of the consequence of dam removal. This basic data should be fully developed in order for the environmental impact statement to be adequate.

As joint users of the City of Port Angeles industrial water line, which draws water from the Elwha River, ITT Rayonier and Daishowa have retained the nationally recognized engineering firm of CH_2M Hill to assess the degree of additional water treatment that would be required for the ITT and Daishowa Mills in Port Angeles if the Hydro Projects were removed. The CH_2M Hill report is attached to this comment letter as Exhibit II.

Although constrained by the limited information contained in the DEIS regarding potential water quality impacts associated with dam removal, CH_2M Hill concluded that the operation of both Mills in Port Angeles would be significantly impacted by dam removal, as a consequence of heavy sedimentation and poor water quality.

CH_2M Hill considered two alternatives for treating expected sediment loads in Elwha River water used by the Mills, during and after dam removal. The first alternative involves modification

RESPONSES TO DAISHOWA AMERICA COMPANY

DAC-4: Refer to responses DAC-2 and DAC-3.

DAC-5: Sections 4.2.2.1 and 4.2.2.2 describe impacts of dam removal on total suspended sediment (TSS) values in more detail. The range of TSS concentrations predicted in the DEIS have also been revised.

In Section 4.2.2.3, the staff has proposed alternative measures to minimize water quality impacts to industrial users of the City's water supply under dam removal alternatives. These alternative measures are considerably more cost-effective than those proposed in Exhibit II of this comment letter. The cost estimates provided by the City, and based upon a study conducted by CH2M HILL, assume that the City's industrial supply will continue to be obtained from surface waters of the Elwha River. The high costs described in the CH2M HILL study result from the capital outlay, O&M costs required for a major water treatment facility proposed to remove suspended sediments loads from water obtained from the City's diversion facility on the Elwha River.

Alternatively, the staff proposes the use of subsurface waters to provide water for industrial uses, including Daishowa America. Under this proposal, water would be obtained from Ranney collection facilities proposed in the staff's water quality mitigation plan described in Section 4.2.2.3. Water obtained from deep in the Elwha River streambed would have low turbidity values compared to surface waters. Consequently, suspended sediments in the industrial water supply would be minimal and could be treated using current water treatment facilities. Capital expenditures and O&M costs under the staff-recommended water quality mitigation plan are provided in Appendix A. The staff-recommended measures to minimize water quality impacts to industrial users under the dam removal alternatives would not require the disposal of sediments and would eliminate the need for a new landfill.

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DAC-5 con't

of the existing water treatment system at each Mill. The second alternative requires construction of a new water treatment system near the industrial water intake on the Elwha River. This new facility would remove TSS through alum addition, followed by a rapid mix section, flocculation and settling. Following settling, dewatered solids would be trucked to a landfill. CH_2M Hill concluded that temporary water treatment facilities would be impractical because of the projected five year "construction" period for dam removal and the subsequent minimum five year period of impaired water quality.

CH_2M Hill estimated the capital costs for modification of both Mills' existing water treatment systems to be $15.1 million. In addition, the estimated cost of developing a new landfill for disposal of silt would be $8 million, not including the cost of land acquisition. Annual operation and management ("O&M") costs were estimated at $2.2 million per year.

CH_2M Hill estimated the capital cost of a new treatment facility near the river intake point to be $16.5 million. Estimated cost of the new landfill was $8 million (just as with the first alternative) and O&M costs for the treatment facility at the river intake would be $2.4 million per year.

The CH_2M Hill analysis concludes that, while estimated costs for the two alternatives are approximately the same, the single treatment facility near the river intake offers significant advantages over modification of the existing water treatment systems at the two Mills. Thus, the projected capital cost of treating and disposing of increased sediments in Elwha River water utilized by the two Mills, if the Hydro Projects are removed, is <u>$24.5 million</u>, with annual O&M costs of approximately <u>$2.4 million</u>.

These water quality impacts and the associated economic impacts, which are fully detailed in the attached CH_2M Hill report, must be analyzed by the Commission in order to develop an environmental impact statement that is adequate and in compliance with the National Environmental Policy Act.

2. Flood Conditions

DAC-6

The DEIS fails to adequately consider the potential for flooding in the event the Hydro Projects are removed. Section 4.2.1.1 of the DEIS discusses what are termed "construction impacts on river morphology" in the event of dam removal. In Section 4.2.2.1, the DEIS also discusses water quality impacts during and after dam removal. Neither of these sections provides an adequate analysis of the potential for flooding on the Elwha

DAC-6: The staff proposes the use of additional Ranney collection facilities to obtain water for industrial and the WDF fish rearing channel. Like the City's current water uptake facilities for drinking water, the water uptake facilities would be located approximately 60 feet below the stream bed. Consequently, flooding would not be expected to affect the water quality of the City's water supply. Similarly, changes in bed elevations under the dam removal alternatives are not likely to affect operation of the City's Ranney collector because of the deep location below the riverbed.

Changes in channel geometry following dam removal would potentially cause flooding, which would be mitigated by raising and protecting the existing levees, as described in Sections 4.2.1.2 and 4.2.1.3. Changes in river discharge would not increase flooding because the existing reservoirs have a very limited effect on peak discharge values.

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DAC-6 com'd River, during and after the removal of the dams. Possible flooding following removal of the dams would have serious adverse impacts throughout the Elwha River basin. Impacts from flooding would likely be most severe in the lower basin where the Lower Elwha Clallam Reservation is located and where both the City of Port Angeles and industrial users withdraw water from the river. Flood conditions could adversely affect both the Ranney collector used by the City of Port Angeles for its domestic water system and the industrial water diversion which delivers water to the ITT and Daishowa Mills.

The potential adverse effects of flooding that could occur in the event of dam removal must be considered in greater detail. Flooding has the potential to endanger both lives and property along the Elwha River, as well as the domestic and industrial water supplies of the Port Angeles community. The DEIS reference to flooding, under the dam removal alternative, fails to adequately analyze this significant issue.

CONCLUSION

Daishowa respectfully submits these comments for the record and requests (i) that the Commission incorporate them in its preparation of the final environmental impact statement and (ii) that the Commission respond specifically to Daishowa's comments.

Very truly yours,

RIDDELL, WILLIAMS, BULLITT & WALKINSHAW

Harry E. Grant, Jr.

Harry E. Grant, Jr.
W. Michael Hafferty

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EXHIBIT

Deloitte & Touche

REVIEW OF COST OF POWER ANALYSIS IN
DRAFT ENVIRONMENTAL IMPACT STATEMENT

FERC/DEIS-0059D

Glines Canyon and Elwha Hydroelectric Projects, Washington

Prepared By

DELOITTE & TOUCHE

For Daishowa America Co., Ltd.

June 21, 1991

EXHIBIT I

Deloitte & Touche

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June 21, 1991

Mr. Steve Taniguchi
Daishowa America Co., Ltd.
Columbia Center, Suite 7500
Seattle, WA

RE: Draft Environmental Impact Statement (EIS-0059D)

Dear Mr. Taniguchi:

Daishowa America Co., Ltd., engaged Deloitte & Touche to review the Draft Environmental Impact Statement, Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington (DEIS). Our focus was to analyze objectively the assumptions and methodology used in the DEIS to estimate the cost of power from the Elwha projects and from Port Angeles City Light.

Enclosed you will find a copy of our review of those portions of the DEIS. Please address any questions to Mike Kelly at (206) 292-1800 or Bill Kemp at (503) 222-1341.

Yours very truly,

Deloitte & Touche

Enclosures

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I. INTRODUCTION

In February 1991, the Federal Energy Regulatory Commission (FERC) issued the Draft Environmental Impact Statement, Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington (DEIS). The final relicensing decision by the FERC could dramatically affect the cost of power used by the Port Angeles paper mill, which is currently owned and operated by Daishowa America Co., Ltd. (Daishowa).

In the DEIS, the FERC concluded:

> "The cost of power to the mill from the hydroelectric projects is substantially less than the cost of power purchased from the city (e.g. 10.4 $/megawatthour [MWH] hydroelectric versus 24.1 $/MWH for purchased power in 1989)...
>
> The future amount of power provided to the mill from the Elwha and Glines Canyon projects, and the cost of that power, were estimated by the staff for a 10-year period beginning in 1996, the year when all fish passage facility costs would have been incurred...
>
> The applicant's dam retention plan results in power costs for the hydroelectric projects that are substantially higher (10-year average of 39.0 mills/kWh) than would occur in the absence of project modifications (17.9 mills/kWh). The power costs associated with the applicant's dam retention plan would be comparable, over the first 10 years, to the cost of purchasing BPA power from the City of Port Angeles."[1]

Deloitte & Touche was engaged by Daishowa to review the DEIS's analysis of the cost of power to the Port Angeles mill. This report presents the scope, methodology, and findings of Deloitte & Touche's review.

The purpose of our review was to develop an objective and independent evaluation of the reasonableness of the DEIS's estimates of the costs of generated power from the hydroelectric projects, vs. the alternative of purchasing power from Port Angeles City Light (PACL). Our review focused on the power costs to the Port Angeles mill under the applicant's dam retention proposal and the alternative of removing both dams.

After outlining the scope of this review, our review procedures for each major cost element are described. The findings of the review are then summarized. Finally, our conclusions regarding the review of the DEIS are presented. The Appendices contain graphical representations of our conclusions and details on our cost calculations.

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II. SCOPE OF REVIEW

The Draft Environmental Impact Statement addresses the environmental and economic impacts of four relicensing alternatives for the Glines Canyon and Elwha projects. Our review was limited to the DEIS's assumptions, methodology and conclusions regarding the cost of power to the Daishowa mill in two of the alternatives: the applicant's dam retention proposal and the removal of both dams. Generally, we used the same methodology and assumptions for costing power that the DEIS used, adjusted as noted later in this report. We did not review the alternatives of Glines Canyon removal with retention of Elwha, or the Elwha removal with retention of Glines Canyon options.

For purposes of projecting and classifying certain elements of the cost of power to Daishowa, we researched and applied generally accepted accounting principles, other authoritative accounting literature, electric utility industry standards, and other relevant information. We also gathered information from James River II (the current owner and licensee for the projects) and Daishowa, the current consumer of the energy generated. A partial listing of our research sources follows:

- American Institute of Certified Public Accountants
- Financial Accounting Standards Board (FASB)
- FASB Statements 34, 42, 58, 62, 71, 87, 90, 92, 96, 98, 101
- FASB Interpretation 33
- FASB Technical Bulletin 87-2
- Internal Revenue Bulletin No. 1987-42, Internal Revenue Service (IRS)
- Federal Energy Regulatory Commission (FERC)
- Wholesale Power Rate Projections 1990-2011, Bonneville Power Administration, November 1990
- 1989 Supplement to the 1986 Northwest Conservation and Electric Power Plan, Northwest Power Planning Council, January 1989
- James River II (financial information)
- Daishowa America Co., Ltd. (financial information)

The above-listed sources of information were used in our review of the DEIS. Some of them relate to regulated enterprises (i.e., electric utilities). Only those accounting and economic principles embodied in the literature reviewed that would apply to any potential operator of the dams, whether utility or nonutility, were used for our analysis.

III. REVIEW PROCEDURES

The basic steps we used to review the DEIS were:

1. Understand and replicate the DEIS projections and analysis.
2. Identify and evaluate major components of the DEIS's methodology (vs. dam owner's perspective).
3. Identify and evaluate major cost items (vs. estimates available from other authoritative sources).
4. Determine most appropriate methodology and cost levels and prepare supporting documentation.
5. Calculate the nominal, real, and net present value of the relevant cost projections.
6. Write up, review, and perform quality assurance reviews on this report.

Replicate the DEIS

Deloitte & Touche read the DEIS and compiled a list of questions regarding the assumptions and methodology used in its projections. We then participated in the FERC's April 4, 1991 workshop in Seattle and discussed questions related to the DEIS's methodology and assumptions with a FERC staff representative. Using the information we obtained at the workshop and our review of the DEIS, we successfully replicated the power cost projections used by FERC staff for the dam retention and dam removal alternatives.

Evaluate DEIS's Methodology

We identified the major components of the DEIS's cost projection methodology, and evaluated these components from the perspective of the project owner. Examples of items we evaluated are:

- Period of analysis
- Rate for capitalizing interest during construction
- Discount rate
- Cost of capital rate
- Capital improvement costs and schedule
- Ongoing O&M costs
- Mitigation O&M costs
- Power production levels
- Cost of power purchased from PACL
- Tax effects

After reviewing these DEIS components, we raised a number of issues regarding cost assumptions and treatment. We resolved these issues by relying on generally accepted accounting principles, and relevant electric generation industry standards and practices.

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Determine Appropriate Adjustments to DEIS Methodology

Based on our resolution of the issues raised, we determined what adjustments to the DEIS's methodology would be appropriate. The support for these adjustments is discussed in Section IV below.

Adjustments were limited to those items that we believe were inappropriately estimated or calculated in the DEIS, and that materially affected the results of the DEIS's analysis. The major assumptions used in Deloitte & Touche's power cost projections are listed and compared to those of the DEIS in Appendix B.

Specifically, we adjusted the DEIS projections for the following items:

- Period of analysis
- Rate for capitalizing interest during construction
- Cost of capital rate
- Discount rate
- BPA PF rate
- Repairs and replacements schedule
- Replacement cost of power during construction
- Operations and maintenance expense for current facilities
- Construction costs

In addition to the above list, we identified tax effects as an additional item that was not considered by the FERC, but which has a significant impact of the cost of power comparison. However, to maximize the consistency and comparability between our projections and those of the DEIS, we made no adjustments to the FERC's calculations for tax effects.

Calculate Real and Net Present Value of Power Costs

Using the DEIS methodology as adjusted by Deloitte & Touche, we projected the nominal costs of 168 GWH of electricity over an assumed license term of 1996 to 2045, under the applicant's dam retention proposal and the dam removal alternative. 168 GWH is the average annual generation under the applicant's dam retention proposal. It is the relevant power volume for comparison, since the remainder of the Port Angeles paper mill's power would be supplied by Port Angeles City Light in both alternatives.

The nominal cost projections under the two alternatives then were restated in constant 1996 dollars (i.e., real terms). The net present value of the power cost was also compared.

Quality Assurance Reviews

Quality assurance reviews of the assumptions and methodology used in the analysis were performed by senior managers and senior Deloitte & Touche partners with expertise in electrical generation economics and accounting.

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IV. FINDINGS

Issues Requiring Adjustment

Discussed below are the issues that Deloitte & Touche raised through our review of the DEIS, followed by our opinion as to the appropriate adjustment to resolve each issue.

Period of Analysis

DAC-7

The DEIS compared cost alternatives on a ten year basis. Table 2-18 of the DEIS shows 1996-2005, a ten year period, as the basis of cost comparisons between alternatives.

Deloitte & Touche considered numerous principles, standards, and relevant facts relating the appropriate period of analysis for power costs:

- It is a fundamental principle of economic analysis to evaluate costs and benefits over a term that matches the useful life of the asset in question. The applicant seeks a fifty year operating license, not a ten year license. From the perspective of the dam owner, fifty years is the useful life of the dams.
- FERC staff offered insufficient justification for limiting the period of analysis for the power cost comparison to ten years. At the April 4, 1991 workshop, a FERC staff representative orally told us that a ten year analysis period was used principally because FERC staff did not have BPA rate projections beyond the end of this period (i.e., 2006). We found this to be a weak rationale. The DEIS makes reference to the Wholesale Power Projections 1989-2010 (T 2-17), so the FERC staff had at least official rate projections for at least 14 years of the proposed license term. (BPA's updated projections now go through 2011.)
- Despite its stated reluctance to project BPA rates beyond 2006, FERC staff did project other major cost elements out for a full fifty years. In the DEIS's analysis of the different alternatives, 50 years was used as the period for:
  - Fish facility releases (T 2-5)
  - Cost summaries for each alternative (T 2-7 through T 2-9)
  - Economic analysis summary (T 2-12)
  - Analysis of coal-fired plants (2-32)
  - Capital improvements analysis (2-33).
- For Accelerated Cost Recovery, as defined by the Internal Revenue Service, the dam has a 22 year class life.
- Daishowa's contract for the purchase of the Port Angeles mill explicitly states its expectation that the power generated from the two dams will be used on a long-term basis. One of the reasons Daishowa cited for its purchase of the paper mill was the mill's ability to maintain its competitiveness over the long term due to the relatively low cost of the hydroelectric portion of its power supply.
- The period of analysis can dramatically affect the average unit cost of a project. A longer period of analysis will allow the initial capital costs for mitigation and other project improvements to be spread over a longer period of time.

DAC-7: The term of the cost of power analysis has been extended to 30 years, consistent with the FERC's normal license term for a new license (reference Section 2.7.3).

EXHIBIT

DAC-7 cont'd

After reviewing the DEIS's methodology and considering the above factors, Deloitte & Touche concludes that ten years is not an appropriate period of analysis for the economics of the Elwha projects. We believe that the proper period for analysis should correlate to the expected length of the beneficial life of a license for the two dams, i.e., 50 years.

Capitalized Interest Costs

DAC-8

Mitigation capital costs are the capital expenditures and associated capitalized interest required for the proposed mitigation measures.

The DEIS stated the capital expenditures for mitigation measures in 1990 dollars, based largely on estimates from the applicant's dam retention proposal. We accepted the DEIS's estimate of construction capital expenditures.

To arrive at total mitigation capital costs, the DEIS escalated capital expenditures in 1990 dollars by 5% per year until the year 1994, the midpoint of the assumed 1992-96 construction period. Two years (1994 to 1996) of capitalized interest at 11% were then added to account for the cost of funds used during construction. Deloitte & Touche was orally informed by a FERC staff representative that 11% is a standard rate that is used by FERC for all privately owned hydroelectric projects.

Generally accepted accounting principles (specifically, Financial Accounting Standard 34) dictate that the rate for capitalizing interest during construction be "based on the rates of an enterprise's outstanding borrowings."[2] Thus, the cost of capital rate for outstanding borrowings of the project owner is the appropriate rate for capitalizing interest.

Using Daishowa as an example, Deloitte & Touche estimates that Daishowa's average interest rate on outstanding borrowings is below 9%. Therefore, the 11% assumption used in the DEIS is inconsistent with generally accepted accounting principles.

We have used an interest rate of 9% in calculating capitalized interest during construction. This reduced the capitalized interest portion of total mitigation capital costs by $784,585 in 1996 dollars.

Cost of Capital and Discount Rate

DAC-9

The cost of capital rate is used to calculate the carrying costs associated with debt and equity used to finance capital items throughout the life of the projects. The discount rate is used in calculating the net present value of costs incurred over the period of analysis.

The DEIS used 11% for the cost of capital and discount rates. Deloitte & Touche was orally informed by a FERC staff representative that 11% is a standard rate that is used by FERC for all privately owned hydroelectric projects.

Standard electric industry practice and proper accounting principles require that the cost of capital rate be equal to the weighted average of the enterprise's expected cost of debt and cost of equity. In the case of electric generating projects with assured markets for their output, it is Deloitte & Touche's experience that capital investments would be heavily debt-financed. The relatively low risk and assured revenues would allow high levels of leverage. For example, cogeneration or small hydroelectric projects with Qualifying Facility status typically have assured markets, since utilities are required to purchase their output at avoided cost. QF projects are frequently financed with 90 to 95 percent debt. In such circumstances, the weighted average debt and equity cost would be close to the expected interest cost.

DAC-8: Daishowa is not the project owner, so Daishowa's rate on outstanding borrowings is not particularly relevant. The staff believes that 11 percent is a reasonable approximation, over the long term, of the cost of money (debt and equity combined) for private enterprises. Nonetheless, the EIS has been augmented by an evaluation of the sensitivity of the economic analysis to a 9 percent interest and discount rate (EIS Appendix E).

DAC-9: Refer to response DAC-8.

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It is our judgement that capital improvements to the Elwha projects could also be financed primarily with debt. They have an assured long-term market for their electric output: the Port Angeles paper mill. The mill has maintained a steady level of operations. Its power requirements easily exceed the Elwha projects' output. Project development and operation risks appear to be lower for the Elwha projects than for the typical Qualifying Facility. Therefore, high leverage could be employed to meet financing needs.

DAC-9 cont'd

Again using Daishowa as an example, Daishowa has stated to Deloitte & Touche that, if it were to assume ownership of the Elwha projects, it intends to finance almost all capital improvements with debt. Daishowa's current average cost of outstanding borrowings is below 9%, and may drop significantly if it is successful in its attempts to obtain financing through tax-exempt industrial development bonds.

For reasons similar to those for capitalized interest, the 11% assumption used in the DEIS is inconsistent with standard industry practice and accepted accounting principles. Daishowa's cost of outstanding borrowings and its ability to utilize highly leveraged financing leads us to believe that 9% is an appropriate rate to use for cost of capital and discounting.

We have used a rate of 9% to calculate the carrying cost for capital investments at the projects, and to calculate net present values.

Repairs and Replacements

Repairs and replacements are capital expenditures that are incurred to keep the plant and equipment operating safely and efficiently.

The DEIS used a standard repairs and replacements schedule, supported by a brief review of the projects' past repair and replacements requirements. The DEIS capitalized 100% of the expenditures required in each decade in the sixth year of the decade. For the 1990-99 decade, this treatment does not account for the fact that 60% (1990-1995) of the decade expenditures would have already been made prior to the beginning of the license period (1996).

DAC-10

Deloitte & Touche used the repairs and replacements cost estimate by decade as listed in the DEIS and capitalized an amount equal to 10% of the decade costs in each year of the decade. For the 1990-99 decade, only capital costs of investments made during the period of analysis (1996-2045) were included as costs under relicensing.

Additionally, we reviewed the schedule of repairs and replacements for reasonableness. We found that the repairs and replacements schedule as listed on Table A-7 in the DEIS appears to be inappropriately front-loaded into the early decades of the license term. We believe that the schedule should more evenly allocate the costs between decades. Despite the DEIS's arguably inappropriate capital cost schedule, Deloitte & Touche used the same repair and replacement cost totals by decade as the DEIS. The DEIS's schedule was accepted in order to maximize consistency and comparability between estimates.

DAC-10: It is inappropriate to exclude costs incurred prior to 1996. For example, costs of dam removal are incurred prior to 1996, and they obviously need to be included in the cost analysis.

The repair and replacement schedule was developed by the staff in the context of the dams' current condition, age, and repair and replacement history. The staff sees no basis for its modification.

EXHIBIT

DAC-11

Cost of Replacement Power During Construction

The cost of replacement power represents the costs incurred during the period of construction to replace the power that was not able to be generated due to ongoing construction.

In calculating the construction costs, the DEIS capitalized an amount equal to the estimated cost of outage during construction. It is unclear to Deloitte & Touche why the DEIS capitalized the increased costs for replacement power. Proper accounting treatment dictates that the costs of purchasing power during construction be expensed as incurred. Since all replacement costs of power will be incurred prior to 1996, these costs should not be capitalized or included in the cost stream for 1996 forward.

This adjustment resulted in a reduction of $1,525,340 (1994 dollars) in mitigation capital costs for the license term.

Operation and Maintenance Expense

Operations and maintenance expense consists of the annual project-related expenditures. For this analysis, the O&M has two components. The first component is the expenditures required to operate and maintain the facilities as they currently exist. The second component is the expenditures required to operate and maintain the additional mitigation facilities.

The DEIS forecasted O&M expenses for current facilities by inflating a base period O&M expense at 5% per year. One year (1989) was used as the base period. According to James River II, costs booked to O&M in 1989 contained significant expenses of a non-recurring nature, i.e., turbine overhaul expenses. 1989 was not, therefore, a representative year for long-term recurring O&M expenses.

To ensure that the base period for O&M expenses is representative, Deloitte & Touche used the average of the last three years' O&M costs (1988-1990), stated in 1990 dollars. This resulted in a reduction of $483,775 in O&M expenses for current facilities for the initial year of 1996. We accepted the DEIS's use of a 5% inflation rate.

For O&M associated with mitigation facilities, Deloitte & Touche used without adjustment the estimate supplied by James River II and shown in Table A-23 of the DEIS.

DAC-12

BPA PF Rate

The Priority Firm (PF) rate from the Bonneville Power Administration (BPA) is used in the calculation of the cost of power received from Port Angeles City Light. Both we and the DEIS compute the PACL rate as the BPA PF rate plus a mark-up percentage of 11%.

The FERC used Wholesale Power Rate Projections 1989-2010[3] as its authoritative source for the BPA PF Rate. Deloitte & Touche relied on the more current Wholesale Power Rate Projections 1990-2011,[4] which became available in November 1990. A FERC staff representative acknowledged orally at the April 4, 1991 workshop that it would be appropriate to use the more recent BPA rate projections. They are slightly higher than the earlier projections used in the DEIS.

DAC-11: The staff agrees. The economic and cost of power analyses have been revised accordingly.

DAC-12: In the FEIS, the staff uses BPA's published rate projections to the year 2011, and then escalates to the end of the evaluation period based on information from BPA. Reference Section 2.7.3, Table 2-19.

Concern about upward pressure on BPA rates are shared by the staff. Section 1.4.3.1 summarizes the principal uncertainties in the region's resource base.

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BPA expects rate increases to accelerate after the year 2005, since new resources will need to be added to service load growth in the Northwest. For purposes of estimating the costs of purchased power after the year 2011, we escalated the BPA PF rate at a rate equal to the compound growth rate of the last three years of BPA's published projections (i.e., 2008-2011). This results in an average rate of increase of 6.3% per year after 2011. We believe this is a conservative assumption. By comparison, BPA's PF rate increased an average of 19.8% per year in the 1979-88 period.

DAC-12 Although we use BPA's published rate projections and conservatively extrapolate beyond 2011, we believe these rates understate the likely long-term cost of BPA PF power. There are several major risks associated with the use of BPA PF power. BPA PF rates could be significantly higher than officially projected if any one of these risks are realized:

- BPA may be forced by the Endangered Species Act to increase stream flow during fish migration periods to allow for fish passage. This would reduce BPA's kWh sales and require significant rate increases.
- BPA may lose its appeal of the initial decision in the WPPSS "Cost-Sharing" litigation. This effectively would add up to $1 billion to BPA's outstanding debt, again requiring rate increases.

Any prudent business would consider these risks in evaluating the benefits of alternative power supplies.

<u>Tax Effects</u>

The DEIS did not consider how federal and state tax laws could affect the net cost of the Elwha projects. Nonetheless, taxes are a significant cost to the project owner. The tax laws would generally treat the dam retention alternative more favorably, primarily because of the availability of accelerated depreciation for mitigation and other capital costs.

DAC-13 The project owner could use accelerated depreciation, as defined in Section 168 of the Internal Revenue Code, for the capital costs associated with dam retention. Its tax liabilities would be reduced during the early years of the hydro projects license term, which would increase the net present value of the projects. In the dam removal alternative, accelerated depreciation is not available because power purchase costs are treated as a current year expense.

Deloitte & Touche believes that the tax consequences are very real and should enter into the economic evaluation of the alternatives. However, to maximize consistency and comparability between the FERC's and our methodology, we did not quantify any adjustment for tax consequences. This is another factor making our estimate of the value of project power to the project owner conservative.

DAC-13: Staff believes the economic and cost of power analyses, absent differential tax treatment, serve as the appropriate basis for comparing the alternatives.

V. CONCLUSIONS

Deloitte & Touche has reviewed the Federal Energy Regulatory Commission's Draft Environmental Impact Statement, Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington, to determine if the power costs to the dam owner under the applicant's dam retention proposal and the dam removal alternative were reasonably represented. During the course of our review, we researched and applied generally accepted accounting principles, other authoritative accounting literature, electric utility industry standards, and other relevant information. We also gathered information from James River II (the current owner and licensee for the projects) and Daishowa, the current consumer of the energy generated.

DAC-14 We conclude that the draft DEIS substantially understates the cost advantage of hydroelectric power to the project owner. Its treatment of several major cost components does not reasonably represent the projected cost of operating the dams over the license term.

We adjusted the DEIS's assumptions and methodology based on our review. The methodology as adjusted by Deloitte & Touche was used to forecast project cost components over the license term. In order to keep cost projections comparable, we used the same basic methodology as the DEIS except for the specific items mentioned in Section IV.

The methodology components and cost assumptions that most significantly contributed to the DEIS's overstatement of the relative costs of project generation and mitigation were:

- Period of Analysis
- Capitalized Interest Costs
- Cost of Capital and Discount Rate
- O&M Costs for Current Facilities
- Repairs and Replacements Schedule
- Cost of Purchased Power from Port Angeles City Light

The cost advantage for the Elwha projects (vs. PACL purchased power) would be even greater if less conservative assumptions on the long-term BPA Priority Firm rate were used, or if tax effects were considered.

Appendix A graphically shows the difference between the costs of owning and operating the two hydroelectric facilities vs. the cost of purchasing the same amount of power from Port Angeles City Light. The "reference" amount represents the project costs before the addition of mitigation costs. Appendix B contains additional detail on our cost calculations.

DAC-14: Refer to responses DAC-7 through DAC-13.

EXHIBIT

For evaluation purposes, the table below summarizes the comparison between the cost of purchasing 168 GWH from PACL and the cost of generating the same amount of energy under the applicant's dam retention proposal.

Cost of PACL Purchase vs. Mitigated Hydro
1996-2045 License Term

Option	Average Nominal Cost (mills/kWh)	Average Real Cost (1996 mills/kWh)	NPV of 1996-2045 Cost Stream (1996 $)
Purchases from PACL	183.2	39.5	$129,988,572
Mitigated Hydro	114.9	18.4	72,273,883
Difference	68.3	21.1	$57,714,689

The foregoing review and analysis demonstrates that dam retention, with mitigation as proposed by the applicant, would provide power at a much lower cost than purchases of BPA power from Port Angeles City Light.

The operation of the dams gives the Port Angeles paper mill an economical source of power that is important to maintaining its long-term competitiveness.

VI. FOOTNOTES

1 Draft Environmental Impact Statement, Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington (Federal Energy Regulatory Commission, Washington, D.C.), 2-35.

2 Current Text Accounting Standards as of June 1, 1990, Volume I (Financial Accounting Standards Board, Norwalk, Connecticut), p. 26971.

3 Wholesale Power Rate Projections 1989-2010, Bonneville Power Administration, October 1989.

4 Wholesale Power Rate Projections 1990-2011, Bonneville Power Administration, November 1990.

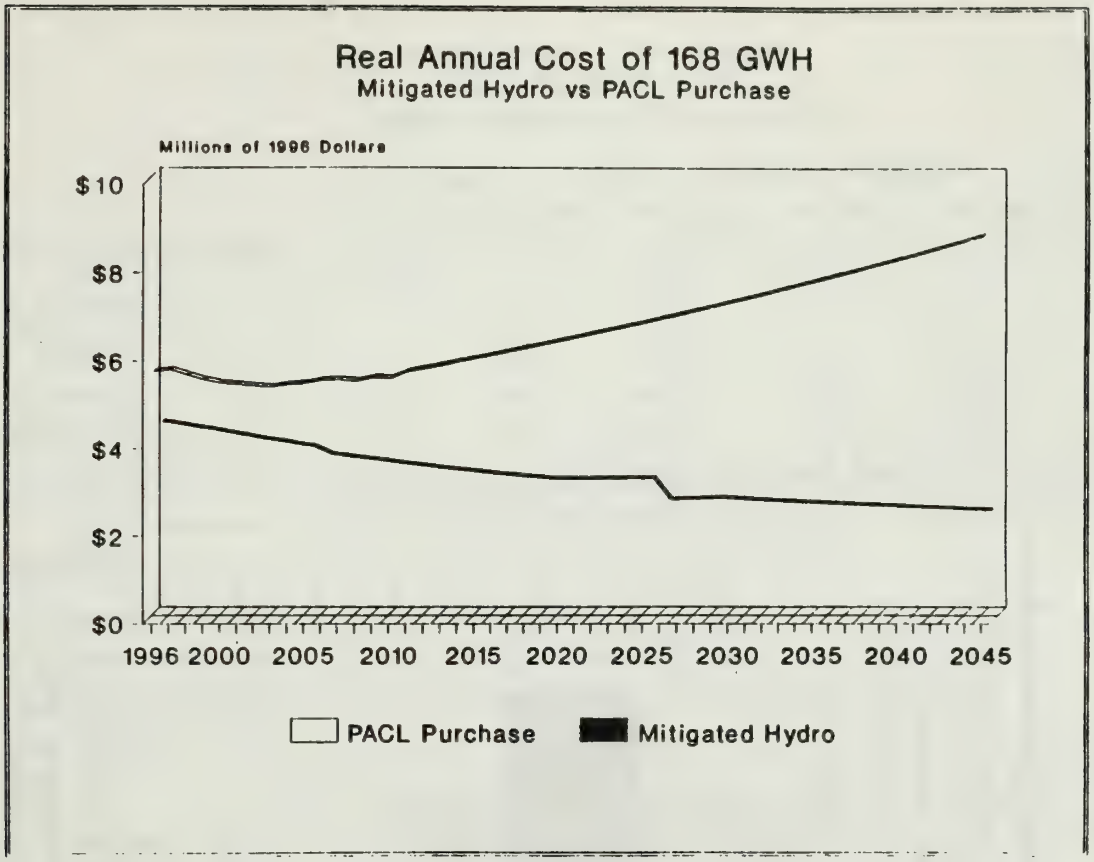

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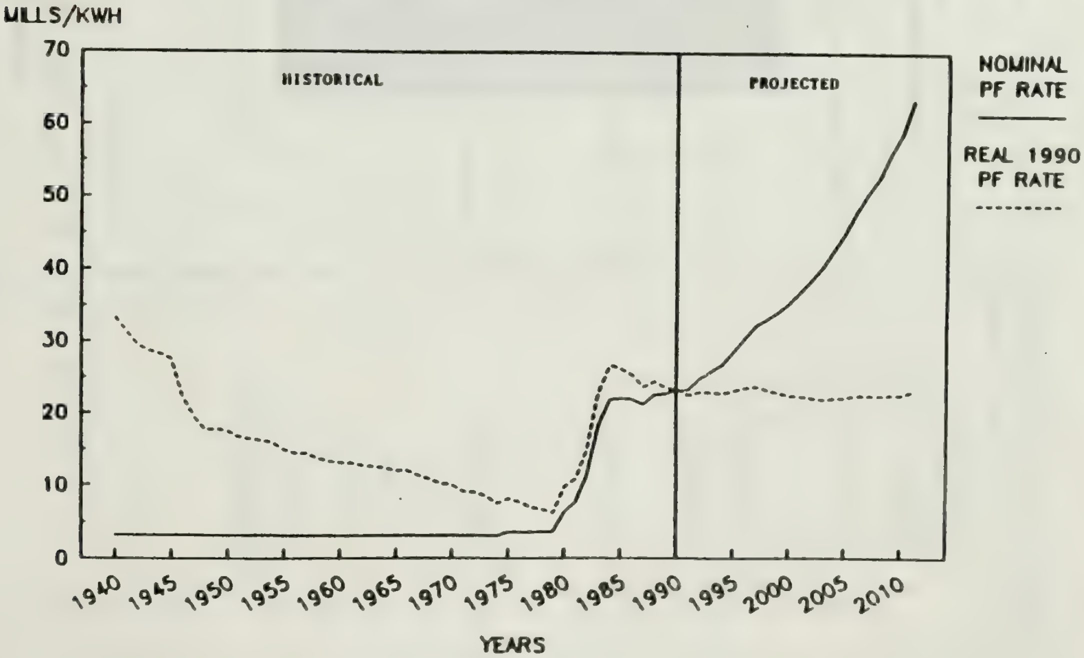
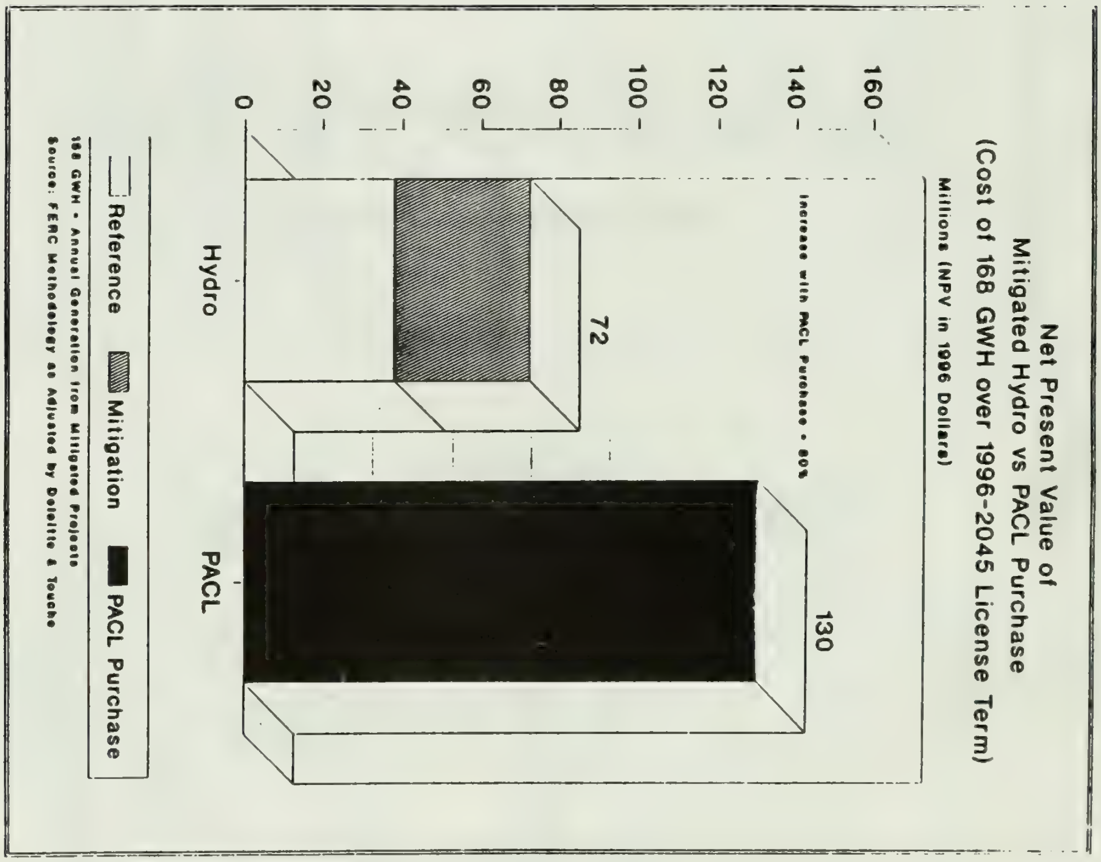
FIGURE 7
HISTORICAL & PROJECTED PF RATES
(REAL 1990 AND NOMINAL MILLS/KWH)




Net Present Value of
Mitigated Hydro vs PACL Purchase
(Cost of 168 GWH over 1996-2045 License Term)
Millions (NPV in 1996 Dollars)
Increase with PACL Purchase = 80%
160
140
120
100
80
60
40
20
0
72
130
Hydro
PACL
Reference
Mitigation
PACL Purchase
168 GWH = Annual Generation from Mitigated Projects
Source: FERC Methodology as Adjusted by Deloitte & Touche

EXHIBIT

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Mitigated Hydro vs. PACL Purchase
Cost Summary By Decade
Average Annual Cost in 1996 Dollars (1)

	1996-2005		2006-2015		2016-2025		2026-2035		2036-2045	
	(1000's)	Mills	(1000's)	Mills	(1000's)	Mills	(1000's)	Mills	(1000's)	Mills
Re-licensing Power Volume	168,088		168,088		168,088		168,088		168,088	
PACL Purchase										
BPA PF Rate		29.47		30.48		34.48		39.17		44.48
PACL Margin @ 11%		3.24		3.35		3.79		4.31		4.89
Cost Per KWH from PACL		32.71		33.83		38.26		43.48		49.37
Cost of Power from PACL	$5,498	32.71	$5,686	33.83	$6,436	38.26	$7,308	43.48	$8,299	49.37
Mitigated Hydro										
Reference Operation & Maintenance	$1,560	9.28	$1,560	9.28	$1,560	9.28	$1,560	9.28	$1,560	9.28
Reference Repairs & Replacements	$143	0.85	$236	1.40	$312	1.86	$428	2.55	$299	1.80
Mitigation Operation & Maintenance	$694	4.13	$574	3.41	$574	3.41	$574	3.41	$574	3.41
Mitigation Capital Costs	$1,072	6.38	$1,026	6.11	$630	3.75	$0	0.00	$0	0.00
Total	$4,069	24.21	$3,395	20.20	$3,076	18.30	$2,561	15.24	$2,402	14.29
Net Hydro Savings	$1,429	8.50	$2,291	13.63	$3,359	19.96	$4,747	28.24	$5,897	35.08

(1) Total Nominal Cost Per Decade / 10

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Net Present Value of Cost Components
Mitigated Hydro vs. PACL Purchase
(1996 $)

	50 Year NPV
Re-licensing Power Volume	168,088 GWH
PACL Purchase	
BPA PF Purchases	$117,106,822
PACL Margin @ 11%	12,881,750
Cost of Power from PACL	$129,988,572
Mitigated Hydro	
Reference Operation & Maintenance	$32,982,708
Reference Repairs & Replacements	5,037,377
Mitigation Operation & Maintenance	13,068,221
Mitigation Capital Costs	21,185,577
Total	$72,273,883
Net Hydro Savings	$57,714,689

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Cost of Power: Mitigated Hydro vs. PACL Purchase
Summary by Year
(168 GWH)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Re-licensing Power Volume	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068
PACL Purchase										
BPA PF Rate	30.60	32.30	33.70	34.20	35.40	37.00	38.60	40.40	42.60	45.20
PACL Margin @ 11%	3.36	3.55	3.65	3.76	3.89	4.07	4.25	4.44	4.71	4.97
Cost Per KWH from PACL	33.96	35.85	36.65	37.96	39.29	41.07	42.85	44.84	47.31	50.17
Cost of Power from PACL	$5,660,610	$6,026,400	$6,164,379	$6,380,067	$6,604,860	$6,903,374	$7,201,898	$7,537,736	$7,965,628	$8,433,311
Mitigated Hydro										
Reference Operation & Maintenance	$1,559,671	$1,637,865	$1,719,758	$1,805,746	$1,896,033	$1,990,835	$2,090,377	$2,194,896	$2,304,640	$2,419,872
Reference Repairs & Replacements	37,007	77,270	118,840	162,470	185,136	208,828	233,605	260,134	287,073	316,580
Mitigation Operation & Maintenance	694,170	728,878	765,322	803,588	843,767	885,956	930,254	976,766	1,025,605	1,076,885
Mitigation Capital Costs	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127
Total	$4,353,095	$4,506,140	$4,666,047	$4,833,940	$4,987,064	$5,147,844	$5,316,062	$5,493,922	$5,680,045	$5,875,474
Net Hydro Savings	$1,236,764	$1,520,310	$1,528,332	$1,547,016	$1,617,796	$1,756,630	$1,885,296	$2,043,816	$2,285,480	$2,557,837

Cost of Power: Mitigated Hydro vs. PACL Purchase
Summary by Year
(168 GWH)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Re-licensing Power Volume	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068
PACL Purchase										
BPA PF Rate	48.10	50.60	52.80	56.20	58.90	63.50	67.53	71.81	76.37	81.21
PACL Margin @ 11%	5.29	5.57	5.81	6.18	6.48	6.99	7.43	7.90	8.40	8.93
Cost Per KWH from PACL	53.39	56.17	58.61	62.38	65.38	70.49	74.96	79.71	84.77	90.15
Cost of Power from PACL	$8,974,396	$9,440,831	$9,851,202	$10,485,069	$10,989,425	$11,847,063	$12,680,306	$13,396,616	$14,248,634	$15,152,676
Mitigated Hydro										
Reference Operation & Maintenance	$2,540,066	$2,667,909	$2,801,305	$2,941,370	$3,088,438	$3,242,860	$3,405,003	$3,575,254	$3,754,016	$3,941,717
Reference Repairs & Replacements	348,852	378,633	412,307	447,456	472,894	499,805	527,661	557,100	588,021	620,488
Mitigation Operation & Maintenance	934,270	980,964	1,030,033	1,081,535	1,135,611	1,192,392	1,252,012	1,314,612	1,380,343	1,449,360
Mitigation Capital Costs	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127
Total	$5,884,216	$6,089,653	$6,306,772	$6,532,467	$6,759,071	$6,995,964	$7,246,793	$7,509,993	$7,784,507	$8,073,682
Net Hydro Savings	$3,090,171	$3,350,678	$3,545,599	$3,953,179	$4,230,354	$4,850,099	$5,433,514	$5,886,624	$6,464,127	$7,078,994

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Cost of Power: Mitigated Hydro vs. PACL Purchase
Summary by Year
(168 GWH)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Re-licensing Power Volume	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068
PACL Purchase										
BPA PF Rate	86.37	91.84	97.67	103.87	110.46	117.46	124.82	132.84	141.27	150.23
PACL Margin @ 11%	9.50	10.10	10.74	11.43	12.15	12.92	13.74	14.61	15.54	16.53
Cost Per KWH from PACL	95.87	101.95	108.42	115.29	122.61	130.38	138.56	147.45	156.81	166.76
Cost of Power from PACL	$16,113,068	$17,128,141	$18,223,268	$19,378,388	$20,608,008	$21,916,242	$23,306,623	$24,785,211	$26,357,802	$28,029,746
Mitigated Hydro										
Reference Operation & Maintenance	$4,138,003	$4,345,743	$4,563,030	$4,791,182	$5,030,741	$5,282,278	$5,546,392	$5,823,711	$6,114,897	$6,420,642
Reference Repairs & Replacements	654,579	689,374	727,056	767,422	810,833	1,061,414	1,219,524	1,385,540	1,560,856	1,742,880
Mitigation Operation & Maintenance	1,521,026	1,597,010	1,677,815	1,761,706	1,849,791	1,942,281	2,039,395	2,141,365	2,248,433	2,360,855
Mitigation Capital Costs	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127	2,062,127
Total	$8,377,538	$8,690,163	$9,030,031	$9,382,437	$9,853,492	$10,348,100	$10,867,438	$11,412,743	$11,986,313	$12,586,512
Net Hydro Savings	$7,736,000	$8,438,078	$9,192,830	$9,996,825	$10,766,314	$11,568,142	$12,438,186	$13,372,468	$14,372,289	$15,443,234

Cost of Power: Mitigated Hydro vs. PACL Purchase
Summary by Year
(168 GWH)

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Re-licensing Power Volume	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068	168,068
PACL Purchase										
BPA PF Rate	159.76	169.90	180.06	192.14	204.33	217.28	231.07	245.73	261.32	277.90
PACL Margin @ 11%	17.57	18.69	19.87	21.14	22.48	23.90	25.42	27.03	28.75	30.57
Cost Per KWH from PACL	177.34	188.58	200.56	213.27	226.80	241.18	256.49	272.76	290.07	308.47
Cost of Power from PACL	$29,807,072	$31,688,618	$33,710,016	$35,846,063	$38,122,862	$40,541,402	$43,113,376	$45,846,818	$48,767,179	$51,860,387
Mitigated Hydro										
Reference Operation & Maintenance	$6,741,674	$7,078,758	$7,432,696	$7,804,330	$8,194,547	$8,604,274	$9,034,488	$9,486,212	$9,960,523	$10,458,549
Reference Repairs & Replacements	1,897,376	2,056,566	2,229,907	2,406,745	2,406,646	2,404,441	2,402,129	2,399,666	2,397,144	2,394,405
Mitigation Operation & Maintenance	2,476,997	2,602,642	2,732,994	2,869,633	3,013,115	3,163,771	3,321,959	3,488,057	3,662,460	3,845,583
Mitigation Capital Costs	0	0	0	0	0	0	0	0	0	0
Total	$11,117,046	$11,741,166	$12,395,597	$13,082,708	$13,614,308	$14,172,486	$14,758,574	$15,373,866	$16,020,127	$16,698,387
Net Hydro Savings	$18,690,026	$19,957,824	$21,314,420	$22,763,354	$24,508,554	$26,368,916	$28,354,802	$30,474,952	$32,737,061	$35,161,779

Cost of Power: Mitigated Hydro vs. PACL Purchase
Summary by Year
(168 GWH)

	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Re-licensing Power Volume	168,088	168,088	168,088	168,088	168,088	168,088	168,088	168,088	168,088	168,088
PACL Purchase										
BPA PF Rate	295.53	314.28	334.22	355.42	377.97	401.95	427.45	454.57	483.41	514.07
PACL Margin @ 11%	32.51	34.57	36.76	39.10	41.58	44.21	47.02	50.00	53.17	56.55
Cost Per KWH from PACL	328.04	348.85	370.98	394.52	419.55	446.16	474.47	504.57	536.58	570.62
Cost of Power from PACL	$55,139,789	$58,637,995	$62,357,923	$66,313,961	$70,520,953	$74,994,950	$79,752,574	$84,812,131	$90,192,079	$95,914,654
Mitigated Hydro										
Reference Operation & Maintenance	$10,981,477	$11,530,550	$12,107,078	$12,712,432	$13,348,053	$14,015,456	$14,716,229	$15,452,040	$16,224,642	$17,035,874
Reference Repairs & Replacements	2,391,651	2,364,097	2,335,895	2,302,330	2,350,890	2,330,168	2,302,142	2,272,893	2,241,772	2,209,305
Mitigation Operation & Maintenance	4,037,943	4,239,790	4,451,743	4,674,331	4,908,047	5,153,449	5,411,122	5,681,678	5,965,762	6,264,050
Mitigation Capital Costs	0	0	0	0	0	0	0	0	0	0
Total	$17,410,990	$18,169,003	$18,944,416	$19,789,190	$20,613,000	$21,498,994	$22,429,493	$23,406,412	$24,432,177	$25,509,230
Net Hydro Savings	$37,728,799	$40,478,992	$43,413,006	$46,544,861	$49,907,954	$53,495,799	$57,323,081	$61,405,719	$65,760,494	$70,405,324

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Deloitte & Touche
Assumptions of Cost Analysis

	Draft Environmental Impact Study	Deloitte & Touche
Term of Analysis	10 years	50 years
Discount Rate	11.00%	9.00%
Cost of Capital	11.00%	9.00%
Inflation Rate	5.00%	Same
Amortization Years	30.00	Same
Repairs & Replacements	Estimated in 1990 dollars by the FERC; escalated at 5% annually (inflation rate); decade expenses are capitalized in 6th year of decade.	Estimated in 1990 dollars by FERC; escalated at 5% annually (inflation rate); decade expenses are capitalized evenly (10%) per year in decade 1990-95 R&R is outside term of analysis
O&M Expenses	1898 O&M (in 1990 $); escalated at 5% annually	Average of 1988-1990 O&M (in 1990 $); escalated at 5 annually
Construction Costs	1990 FERC construction cost estimate; escalated for 4 years at 5% (inflation rate) then escalated for 2 years at 11% (cost of capital)	1990 FERC construction cost estimate; escalated for 4 years at 5% (inflation rate) then escalated for 2 years at 9% (cost of capital)
Replacement Cost of Power	1994 FERC cost of replacement power estimate; escalated at 11% (interest rate) for 2 years; capitalized in 1996	Expensed in year incurred; none capitalized
Annual Mitigation O&M	FERC estimate of mitigation O&M; escalated at 5% (inflation rate) annually.	Same
Fish Production O&M	FERC estimate of mitigation Fish O&M; escalated at 5% (inflation rate) annually.	Same
Annual KWH Produced	168,088,000	Same
Annual KWH Required	400,000,000	Same
PACL Markup on BPA Power	11.00%	Same
BPA PF Rate	October 1989 Wholesale Power Rate Projections 1989-2010. FERC didn't go beyond 2005; After 2010, extended by Deloitte & Touche.	November 1990 Wholesale Power Rate Projections 1990-2011; after 2011, escalated at average 2009-2011 growth rate.
PACL Rate	BPA PF rate + PACL markup percentage	Same

assumpti wk1

Dry Creek Water Association, Inc.

April 25, 1991

Mr. S. Ronald McKitrick
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, D.C. 20426

Dear Mr. McKitrick:

This letter is in regards to the DEIS for the Elwha Dams. We have enclosed copies of the following documents for your information.

1) Dry Creek Water's water rights from State of Washington Department of Ecology.
2) District map.
3) The well site easement on the Elwha River from the Bureau of Indian Affairs.
4) History of Dry Creek Water Association, Inc..
5) Well Site drawing.
6) Dry Creek Water Board of Trustees.

DCW-1 The Dry Creek Water Association Board of Trustees feels that one additional primary resource objective needs to be added to the three objectives. The additional objective is water quality. We feel that all associated costs concerning water quality have not been accessed.

DCW-2 We can not understand why Dry Creek Water Association was not referenced in the DEIS since it was mentioned in the Husey & Associates Engineering Company document on page 25 (Response to August 15, 1989, Request for Additional Information. Schedule B, Items 1 and 2, Rubble and Sediment Disposal. Comments Received on Filing of December 1, 1989, dated February 5, 1990). This document was prepared for James River II, Inc. The DEIS does state that the above mentioned document was used as part of this study.

DCW-3 We feel that the DEIS staff has not allowed enough time nor money for the removal of the dams and restoration of the river. Dry Creek Water Association does not have a filtration system and is concerned about the increase of sediment in the river which will in turn increase the turbidity level in the river. The State of Washington Department of Health classifies our wells as primarily surface water wells. During the winter months, the Elwha River rises to within five feet of our well site. With the [illegible] the protection of the dams, we feel that our well site will be under water.

1826 Edgewood Drive Port Angeles, WA 98362 (206) 452-2780

DCW-1: Refer to responses ITT-25 and ITT-26.

DCW-2: Comment noted. Section 4.2.2.3 has been revised to include current domestic or industrial water supplies.

DCW-3: Although the precise schedule for dam removal cannot be completed until the final design stage, the schedules presented in the EIS reflect the results of engineering evaluations based on experience of the preparers and standard methodologies. With respect to water supplies, further evaluations have been performed with remedial measures and associated costs included in the EIS.

COMMENTS OF DRY CREEK WATER ASSOCIATION, INC.

DCW-4 In closing, we think that the DEIS staff should consider the impacts that dam removal will have on all the domestic and industrial water users within the Port Angeles area.

We hope the information which you requested from our Association can be of some use and if we can be of any further assistance, please feel free to contact our office at (206) 452-2780.

Sincerely,

Cindy Kelly

Cindy Kelly, Manager
for Dry Creek Water Association
Board of Trustees

Enclosures

RESPONSES TO DRY CREEK WATER ASSOCIATION, INC.

DCW-4: **The staff agrees. Sections 4.2.2.2 and 4.2.2.3 more thoroughly address impacts of dam removal on domestic and industrial users of Elwha River water.**

COMMENTS OF DRY CREEK WATER ASSOCIATION, INC.

RESPONSES TO DRY CREEK WATER ASSOCIATION, INC.

DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
October 22, 1979	G 2-25391		

NAME
DRY CREEK WATER ASSOCIATION INC.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
1836 Edgewood Drive	Port Angeles	Washington	98362

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
2 wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	250	176

QUANTITY, TYPE OF USE, PERIOD OF USE
176 acre-feet per year community domestic supply Continuously
(450 services)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
No. 1: 700 feet west and 50 feet south

No. 2: 775 feet west and 125 feet south (both from the east quarter corner of Section 10)

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼SE¼	10	30	7 W	18	Clallam

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Dry Creek Water Association, Inc.

DRAFT
STAFF REPORT

COMMENTS OF DRY CREEK WATER ASSOCIATION, INC.

RESPONSES TO DRY CREEK WATER ASSOCIATION, INC.

Page 2 - G 2-25391

Nothing in this application shall be construed as excusing the applicant from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.

The water source and/or water transmission facilities are not wholly located upon the land owned by the applicant. Issuance of a permit by this department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

REPORTED BY: Richard L. Carter APPROVED BY: V. E. Shaver

DATE: June 30, 1980 DATE: July 1, 1980

The State Water Code requires a permit fee of $20.00 for community domestic supply.

Dry Creek Water Association, Inc.

HISTORY OF DRY CREEK WATER ASSOCIATION, INCORPORATED

The Dry Creek Water Association was established in 1964. The purpose for which the corporation was organized was to acquire, construct, operate, and maintain a water system for the supply of water to persons, firms, corporations, and other users which whom would become shareholders of this corporation. The Association constructed well #1 in 1964 along with one 80,000 gallon concrete reservoir. Well #1 is 20 feet deep and processes 125 gallons per minute. In 1973, two 60,000 gallon reservoirs where installed. In 1980, well #2 was constructed along with a 60,000 gallon steel reservoir. Well #2 is 21 feet deep and processes 125 gallons per minute. The corporation drilled well #3 and well #4 in 1990. Well #3 is 42 feet deep and processes 180 gallons per minute. Well #4 is 48 feet deep and a pump test will be done in May 1991 once the river returns to it's normal condition. The reason that well #4 has not had a pump test is due to the Elwha river has been to high. The corporation plans to have well #1, #2, and #4 on line before the end of 1991. The corporation has water rights on the Elwha river for 250 gallons per minute but once well #4 is completed the corporation will be asked for additional water rights. All the above mentioned wells are located approximately one mile south of the City of Port Angeles water system on the Elwha River. The corporation currently has 36? shareholders. The service area starts off Hwy 101 at the Bear Road to the Elwha River running from the mountains to the water. Shareholders include residential and industrial users.

1826 Edgewood Drive Port Angeles, WA 98362 (206) 452-2780

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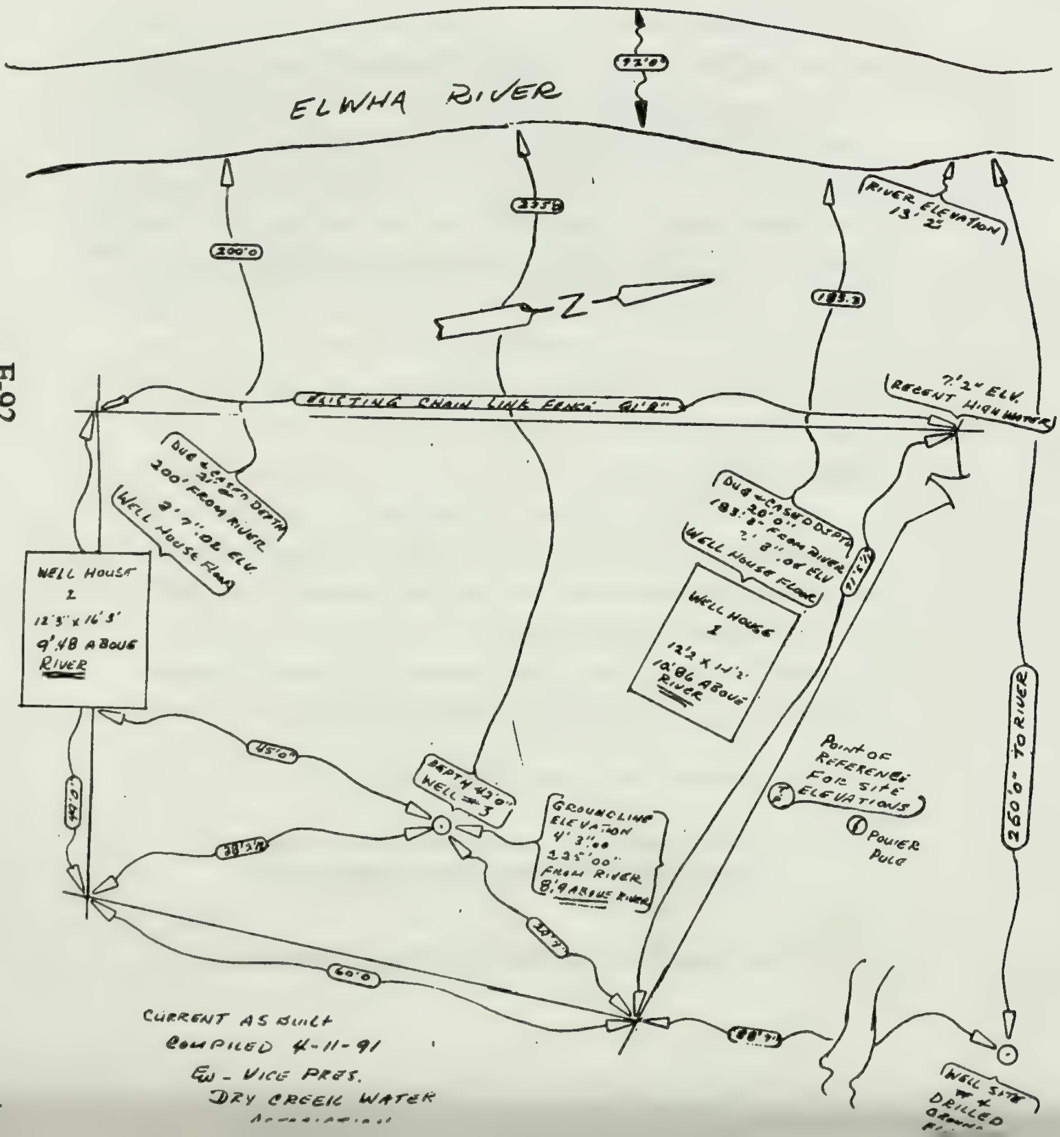
STAFF REPORT

DRY CREEK WATER ASSOCIATION, INC.

WELL SITE DRAWING



Dry Creek Water Association, Inc.

1826 Edgewood Drive Port Angeles, WA 98362 (206) 452-2780

DRAFT
STAFF REPORT

Department of Energy
Washington, DC 20585

Ms Lois Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Re: Glines Canyon (FERC Docket No. P-588-004) and Elwha (FERC Docket No. P-2683-006) Hydroelectric Projects

Dear Ms Cashell:

The Department of Energy (DOE) respectfully submits the attached comments on the Draft Environmental Impact Statement (DEIS) for the Glines Canyon and Elwha Hydroelectric Projects.

An original and fifteen copies of DOE's comments are enclosed for filing. One additional copy is enclosed which I would appreciate your time-stamping and returning to DOE in the enclosed envelope. A copy of DOE's comments is being sent to all parties currently on the service list.

Please note that because of their length only one copy of the attachments to DOE's comments are being filed with your office and no copies of these attachments are being distributed to parties on the service list. These documents, the National Energy Strategy, the NES Technical Annex 2, and the referenced Bonneville Power Administration studies, reports and projections, are publicly available and copies may be obtained by contacting DOE directly.

In addition, filing of the National Energy Strategy and NES Technical Annex 2 constitute a request that these documents be considered a comprehensive plan for FERC consideration under Section 10(a)(2) of the Federal Power Act.

If you have any questions, please contact Paul Carrier, 202-586-5659, or Mayo Lee, 202-586-6958.

Sincerely,

Lawrence A. Gollomp
Assistant General Counsel
Regulatory Interventions & Power Marketing

COMMENTS OF DEPARTMENT OF ENERGY

Glines Canyon Hydroelectric Project: FERC No. 588
Elwha Hydroelectric Project: FERC No. 2683

DEPARTMENT OF ENERGY COMMENTS ON
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

DOE-1

1. The Final Environmental Impact Statement (FEIS) should evaluate the Elwha and Glines Canyon projects for consistency with the National Energy Strategy.

Section 10(a)(2) of the Federal Power Act requires the Commission to consider the extent to which a project is consistent with a comprehensive plan for improving, developing, or conserving a waterway. In FERC Order No. 481-A, the Commission stated that a comprehensive plan is one that: is prepared by an agency established pursuant to Federal law that has the authority to prepare such a plan; is a comprehensive study of one or more of the beneficial uses of a waterway; includes a description of the standards applied, the data relied upon, and the methodology used in preparing the plan; and is filed with the Secretary of the Commission.

On July 26, 1989, President Bush directed the Secretary of Energy to prepare a National Energy Strategy (NES). The NES (Attachment A) was issued on February 20, 1991. The NES is a comprehensive strategy for providing secure supplies of economical energy, including hydropower, for a growing economy while providing for a safer and healthier environment. The NES encourages the licensing and relicensing of hydropower developments at existing dams, such as the Glines Canyon and Elwha dams, because hydropower generation at these facilities has much less severe impacts than the construction of new dams. Hydropower is a beneficial use of a waterway. Specifically, the NES provides the following Administration position with respect to hydropower development:

- On page 15, first column: " [NES] actions are intended primarily to replace outdated equipment, facilitate relicensing, and promote construction of additional capacity at existing hydroelectric facilities;"
- On page 119, Goals and Approaches: "Encourage environmentally acceptable hydroelectric power [by] requiring a continuing review of existing hydropower projects to improve operation and maintenance and identify improvements that can be made economically;"
- On page 121, first and second column: "The total impact of all Strategy actions will be a[n] ... increased generating capacity and energy efficiency at existing projects;" and

RESPONSES TO DEPARTMENT OF ENERGY

DOE-1: The National Energy Strategy's emphasis on licensing and relicensing hydropower development at existing dams is noted. While the NES has not been accepted by the Commission as a "comprehensive plan," the staff notes that alternatives involving dam removal would be inconsistent with certain of the NES goals related to hydropower.

DOE-1 cont'd

On page 123, first column: "For non-Federal hydropower projects, the Strategy calls for FERC to ask all licensees of older hydropower projects to evaluate their potential for efficiency improvements."

NES Technical Annex 2 - Integrated Analysis Supporting the National Energy Strategy: Methodology, Assumptions and Results (Attachment B) describes the standards applied, the data relied upon, and the methodology used in preparing the NES. The filing of the NES and Annex 2 with these comments completes the requirements for the NES to be considered as a comprehensive plan in the FEIS and all future license proceedings.

2. The FEIS should include an evaluation of an alternative that increases project generation and capacity.

In the DEIS, the Commission staff identifies the following three primary resource objectives: 1) the restoration of wild, self-sustaining runs of anadromous fish; 2) restoration of natural conditions within Olympic National Park; and 3) provision of renewable hydroelectric energy. However, the applicant's proposal and all three alternatives evaluated in the DEIS would make changes to the existing projects that benefit the first two objectives at the expense of renewable hydroelectric energy. Failure to consider an alternative that increases renewable hydroelectric energy production biases the DEIS against energy production and can only lead to a Commission decision that reduces the current level of production of renewable hydroelectric energy.

DOE-2

This bias is particularly evident because the only substantial discussion of increasing project generation and capacity is contained in part 1 of appendix A, Applicant's Proposal for Fish Passage. On page 4-38 of the DEIS, the staff considers expansion of the Glines Canyon Powerhouse only as a means of paying for fish bypass screens from the net benefits of expansion ($2.7 million). Staff goes on to determine that the net benefits of expansion are not sufficient to appreciably reduce the cost of fish bypass screens and does not mention expansion again outside of appendix A.

On page 38 of appendix A, the staff concludes that expansion of the Glines Canyon Powerhouse is "technically and economically beneficial." The river flow exceeds the Glines Canyon Powerhouse hydraulic capacity 47 percent of the time, indicating that considerable energy is being lost as water spills over the dam. Powerhouse expansion would make use of these flows. Average annual energy production of renewable hydroelectric energy would increase approximately 23 gigawatthours (GWh), a 22.5 percent increase over present output. The Commission could license the additional generating facilities because they would not be

DOE-2: DOE correctly notes that the possibility of expanding the hydroelectric potential of the Glines Canyon Project is addressed in Appendix A. Powerhouse expansion was not, as DOE suggests, considered only as a means of paying for fish screens. If the power generating capacity were to be expanded, the expansion plan would need, in the view of the staff, a relocated power intake with fish screens. The fish screens, therefore, would be a necessary aspect of the expansion, and the cost of the screens need to be considered a necessary cost of expansion. For this reason, expansion, intake relocation, and screening were evaluated together, and expansion was not deemed economically beneficial. Appendix A, Section 2.2.3 has been modified to remove the source of confusion. Since the powerhouse expansion option, in conjunction with necessary related modifications, would not be economically viable, the staff has not included an increased power generation plan as an additional principal alternative in the EIS. We acknowledge that all alternatives would result in foregoing the opportunity to expand the power generation potential.

DOE-2 cont'd

located within Olympic National Park.

The Commission staff should develop a detailed plan for increasing the production of renewable hydroelectric energy at the projects and evaluate that plan as an additional alternative to the applicant's proposal. Moreover, the evaluations of the other alternatives should be revised to include, as an impact, the lost opportunity for increased production of economical renewable energy that would otherwise be available through project expansion.

DOE-3

3. The FEIS should include a thorough cost-benefit analysis, including a comparison of power generation and fisheries impacts, for each alternative.

The DEIS is not consistent in the time period over which the impacts, benefits and costs are evaluated. For example, on page 4-1 the DEIS states that with the applicant's proposal sediments will continue to be deposited in the Lake Mills and Lake Adwell reservoirs for the next 200 to 400 years, while project energy benefits are calculated over a 50-year period. Commission policy is to relicense a project for 30 to 40 years, depending on the amount of new construction that is required. All analysis in the FEIS should be based on the anticipated duration of the new license.

The DEIS provides a substantial amount of information on the economic and fisheries impacts of four alternatives. Each alternative would have different benefits to the river's substantial anadromous fisheries. Fisheries and power production are the two most important resources provided by this river. A comparison of the economic benefits of fisheries and power generation would be useful in identifying the alternative providing the best balance between power and nonpower resources.

The Commission staff should estimate the expected economic value of the anadromous fishery under each alternative and compare these fishery benefits to the expected power production benefits. It is recognized that the economic value of the fish harvest is not the only environmental benefit provided by restored anadromous fish stocks, and it is also recognized that estimation of the fish harvest would include substantial uncertainties. However, this proposed analysis would at least determine the relative magnitude of fisheries and power benefits. Expected annual benefits of power and fish harvests could then be directly compared.

Most of the information needed to compare fishery and power benefits for the alternatives has been included in the DEIS. Expected power benefits have been estimated. The information needed to evaluate expected fishery benefits include (1) the size

DOE-3: The staff sees no requirement to limit all impact analyses to a set time frame such as 30 to 40 years. Important impacts could occur or continue to occur beyond that period that cannot be ignored. The cost analysis, on the other hand, employs discounting to reflect the time value of money. In the staff's view, 30 years is a sufficient period of analysis to capture the cost effects, since the present value of costs occurring 30 years in the future, at the 11 percent discount rate, are inconsequential.

As DOE notes, the DEIS contains estimates, for each alternative, of future fish production and harvest. Sections 4.1.8, 4.2.8, 4.3.8, and 4.4.8 contain estimates for the economic value of changes in harvest to the extent that such are meaningful.

DOE-3 cont'd
of the anadromous fish stocks, (2) the harvest rate, and (3) the dollar value of fish. The size and harvest of fish stocks under each alternative are estimated in the DEIS. Dollar values of fish should be readily obtainable from the fisheries literature.

DOE-4
Although the DEIS does a good job in describing the environmental impacts of the dam removal alternatives, it is not clear how this work would be funded. The DEIS briefly discusses several possibilities for paying the costs of removal of the dams and restoration of the site (estimated in the DEIS to be $ 30-64 million) if the Commission selects one of these alternatives, but it is unclear what authority the Commission has to order any given approach. In addition, there is no analysis of the impacts

DOE-5
that the economic burden would have on any entity. The FEIS should explore the extent of the Commission's legal authority to require any entity to pay these costs. In addition, the FEIS should evaluate the impacts on varying entities of paying for the cost of dam removal and restoration.

DOE-6
4. <u>The Commission staff should update the analysis of the need for project power to reflect the current need for energy resource acquisition in the region</u>.

The load and resource data in the DEIS needs to be updated. Materials are enclosed (Attachment C) to assist the Commission staff in making the necessary updates. A discussion of the materials and how they can be used to update the data follows.

<u>1990 Pacific Northwest Loads and Resources Study (Study)</u>

The Study can be used to update data on pages 2-30 and 2-32, figure 1-1 (page 1-11) and table 1-1 (page 1-9).

Information on Federal system loads and resources should be included in the FEIS because any additional Daishowa load would be served by the Federal system. The DEIS, by contrast, used regional load and resource data.

The 1990 joint Bonneville Power Administration/Northwest Power Planning Council load forecasts are somewhat higher than the 1989 forecasts because regional population and employment are projected to be about 1% higher by 2011, and the outlook for direct service industrial customers is more optimistic.

Under medium loads, the Federal system would have modest firm energy deficits throughout the entire 20-year study period that could be offset by using available firm resource options. Under medium-low loads, a deficit is not projected until 2005. Under medium-high loads deficits of more than 10% of total firm loads

DOE-4: The Commission's legal authority to require any entity or entities to pay the costs of implementing the alternatives will be addressed as an issue separate and distinct from the environmental evaluation of reasonable alternatives presented in the EIS. In our view, the alternatives evaluated in an EIS need not, and should not, be limited to only those which the lead agency can implement under current authorities

DOE-5: The ability of various entities to pay for the cost of implementing the alternatives might be a consideration in the Commission's ultimate decision on these projects, but such considerations are not viewed by the staff as necessary or appropriate in the environmental evaluation presented in the EIS. Refer to response DOE-4.

DOE-6: The load and resource information in EIS Sections 1.0 and 2.0 has been updated to reflect the Council's 1991 Power Plan. Section 1.4 has been augmented to mention the federal power system load/resource balance. BPA wholesale power rate projections (Section 2.7.3, Table 2-19) have been revised per BPA's letter of September 30, 1991 to Senator Bill Bradley. Finally, the load forecast data for the Daishowa Mill have been confirmed.

DOE-6 cont'd

are projected as soon as 1995. (See Table 7 of the Study on page 26).

Pages 8-25 of the Study provide more detailed information on forecast assumptions.

Wholesale Power Rate Projections 1990 - 2011 (Projections)

The Projections' implicit price deflators can be compared with the 5% inflation assumption on page 2-32 of the DEIS. The Projections can also be used to update table 2-17 on page 2-39, which refers to the previous wholesale power rate projections.

The current, November 1990, power rate projections are slightly higher than the October 1988 projections used in the DEIS. The difference is primarily due to higher resource costs.

The current projections (in real 1990 mills/kWh and nominal mills/kWh) are shown in Table 2 of the Projections, and the new resource/surplus firm power rate projections (in real 1990 mills/kWh and nominal mills/kWh) are shown in Table 4 of the Projections. Table 10 shows the GNP implicit price deflators used to convert nominal prices to real prices.

Current Load Forecast Data-Daishowa

Tables (A-C) labelled "Load Forecast Puget Sound Area Office", delivery points "Daishowa Total" "Daishowa 69 kV" and "Phases I + II Total", show forecasted peak and energy loads for operating years 1990/91-2010/11 by month. Daishowa 69 Kv refers to existing facilities, Phases I + II refer to planned expansions expected to begin in 1998, and Daishowa Total combines the existing and planned loads together. These forecasts, revised 10/11/90, are of the City of Port Angeles' purchases from Bonneville for Daishowa, assuming retention of the Elwha River dams.

There is an inconsistency in the DEIS forecasted/assumed amounts used. The scenarios on page 2-38 of 400 GWh for current equipment plus the potential addition of Phase I are roughly parallel to our forecasts, though they do not include the further addition of Phase II. However, page 2-29 discusses what appears to be a different expansion of 1708 GWh. It is not clear if this is Phases I and II combined. Also it is not clear if the total after expansion is equal to 1708 GWh or if the 1708 is in addition to the 400 GWh assumed for currently operating facilities.

Historic Data - Daishowa

DOE-6 cont'd

Tables (D-F) labelled "Historical Data Base - Port Angeles" show historic monthly energy and peak data for the City of Port Angeles' Daishowa feeder. Tables are attached for 1988, 1989 and 1990. For each month, both noncoincident and billing peaks are shown, with the date and time they occurred.

Table G labelled "Port Angeles Daishowa, Actual Data" shows monthly and 12 month rolling average energy, peak and load factor data for 1988-1990.

DRAFT
STAFF REPORT

COMMENTS OF DEPARTMENT OF INTERIOR

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

TAKE PRIDE IN AMERICA

ER 91/195

Honorable Lois D. Cashell
Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington D.C. 20426

Dear Ms: Cashell:

We have reviewed the draft environmental impact statement (DEIS) for the Glines Canyon and Elwha projects (FERC Nos. 588 and 2683), Clallam County, Washington. We have the following comments and recommendations.

The DEIS is well written and provides a concise summary of the issues which must be addressed in a decision regarding these projects. We are generally impressed with the effort to objectively consider all alternatives. We are pleased that the alternatives of retaining both dams and removing both dams have been developed to a similar level of detail so that a valid comparison can be made.

In a letter of June 12, 1991, the three involved bureaus (Fish and Wildlife Service, FWS; National Park Service, NPS; and Bureau of Indian Affairs, BIA) of this Department updated their positions on the licensing of these two projects. This letter will confine itself to the adequacy of the DEIS. The following thirteen items constitute the major issues we have with the document. The technical comments and recommendations itemized by page number are enclosed.

DOI-1

1. PURPOSE OF THE DEIS
The principle issue for consideration in the DEIS and FEIS is not (as stated on page 5-1 in the DEIS) "The extent to which anadromous fish restoration would be realized with the applicant's proposal." This statement grossly simplifies the determination which must be made. The statement should be revised to reflect the real issue, which is the extent to which each alternative achieves a desirable balance between the development and non-development of the resources of the Elwha River. The need for project power, the availability of alternate power, the potential for conservation, the proportion of the Elwha River which is within a national park, the treaty rights of the Indian Tribes, and the recommendations of the resource agencies all must be considered.

DOI-2

2. LICENSING JURISDICTION
We have consistently argued that the Federal Energy Regulatory Commission (FERC) has no authority to license hydroelectric projects within units of the National Park System pursuant to the Federal Power Act, 16 U.S.C. 791a-825(r)(1986). Only Congress can provide the specific authority for the Glines Canyon Project.

In response to petitions filed by the intervenors in this proceeding, FERC issued an order on October 19, 1990, declaring that it had jurisdiction to issue a new license for the Glines Canyon Project. As required by the Federal Power Act, 16 U.S.C. 8251, the intervenors filed a request for rehearing and reconsideration and FERC denied the request on April 5, 1991. Subsequently, the intervenors have all taken the appropriate steps to file a judicial appeal of the FERC order.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-1: The referenced statement has been deleted.

DOI-2: Section 1.2.1.2 has been updated to reflect the current legal proceedings.

COMMENTS OF DEPARTMENT OF INTERIOR

DOI-2 cont'd

On behalf of the Department of the Interior and the Department of Commerce, the Department of Justice filed on June 4, 1991, with the United States Court of Appeals for the Ninth Circuit, an appeal of the FERC order concerning jurisdiction to issue a new license for a hydroelectric project located within a national park. This section needs to better express this position.

DOI-3

3. PUBLIC INTEREST

In determining the public interest, FERC is required by the Federal Power Act to give equal consideration to all uses of water resources, both developmental and non-developmental. We believe the DEIS considers a reasonable range of non-developmental aspects of this issue. However, in describing the effects of each alternative on the cultural and natural resource values, the DEIS does not reflect the full extent of FERC's responsibility to consider the public interest. A major aspect of the public concern, largely ignored in the document, and not mentioned in the FERC staff's findings (section 5.6), is the unmitigated, longstanding past damage to cultural and natural resources caused by the projects.

Past damages include losses of natural and cultural resource values within Olympic National Park (ONP), losses suffered by local residents, Tribal, commercial, and recreational fisheries, and losses of Tribal cultural and spiritual values. Dam retention alternatives would allow continued loss of most stocks of fish, and continued impact to tribal cultural/spiritual values, and to ONP values. Congress has affirmed that the authorization of activities in national parks "...shall not be exercised in derogation of the values and purposes for which these various areas have been established" (16 U.S.C. 1a-1). Based upon this legislation and the Federal Power Act, it is incumbent upon FERC to consider--in light of substantial, unmitigated, past damages--the equitability of allowing continued losses of non-developmental values of the Elwha River.

DOI-4

4. ALTERNATIVE SOURCES OF POWER; RECYCLING FACILITY

In addition to weighing developmental and non-developmental aspects of licensing decisions, the Commission is required to consider "...the reasonable costs and reasonable availability of alternative sources of power, taking into consideration conservation...." A major omission in the DEIS is a discussion of the recycling facility being constructed by Daishowa America. Certainly this facility will impact the company's energy demand and conservation potential, which in turn relate to the need for project power. The FEIS should consider effects of the recycling facility on the need for project power, and should include a discussion of findings of Daishowa America's energy audit. Implications of this information for each alternative and for the Commission's responsibility to consider conservation and the need for power should be clearly discussed in the summary chapter.

DOI-5

5. SUBJECTIVE EVALUATIONS

The DEIS lends an overall impression of objectivity. However, preferential views do appear and they are inappropriate in a public disclosure document. The summary section (in particular Section 5) suffers from value judgments and coercive language (e.g. "Pursuit of that course...would be associated with extremely high costs, technical challenges of a high order, and very substantial adverse impacts"). Section 5.6 (Findings) is biased and unbalanced. This section de-emphasizes the negative aspects of the applicant's proposal, while highlighting the positive aspects. The section stresses the negative aspects of removal of both dams, while presenting none of the positive aspects. The intermediate alternatives are barely mentioned. The FEIS would be much improved by removing subjective evaluations, and presenting a balanced presentation of facts, with no opinions regarding these facts.

DOI-6

6. JOINT FISH AND WILDLIFE AGENCIES (JFWA) RECOMMENDATIONS

The Federal Power Act requires FERC to solicit recommendations from resource agencies and Indian Tribes affected by these projects. Yet, the DEIS does not identify the views repeatedly expressed by the JFWA regarding additional information needed before licensing, the effectiveness of particular mitigation measures, the need for development of a specific restoration plan prior to

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-3: In considering the licensing of existing projects, the Commission adopts current environmental conditions as the baseline against which to compare the effects of alternatives. The Commission seeks to improve current conditions in the context of today's resource values and priorities. Discussion of past damages is relevant only to the extent that it helps the Commission define the relative importance of resource objectives.

DOI-4: Section 2.7.3 has been supplemented to include discussion of the recycling facility and the energy audit.

DOI-5: Staff disagrees that Section 5.6 is biased. The text has been revised, however, to achieve better balance and to describe both the positive and negative aspects of each alternative. The presentation of staff's opinion is appropriate to Section 5 because it is in this section that staff must present and support its conclusions.

DOI-6: A new Section 5.6.3 has been added to clarify the staff's position with regard to fish and wildlife recommendations. The recent Ohio River decision (U.S. Court of Appeals, U.S. Department of Interior vs. FERC, January 10, 1992) makes it clear that the Commission has the authority to decide what studies and information are necessary for the Commission to make an informed decision.

COMMENTS OF DEPARTMENT OF INTERIOR

Honorable Lois D. Cashell 3

DOI-6 cont'd licensing, etc. The JFWA have previously noted deficiencies in the applicant's proposed mitigation (trap and haul, low spill rates, etc.), yet these are not identified in the DEIS. The DEIS does acknowledge that additional information may be needed, especially regarding recommendations for additional mitigation. However, there is no indication that this information would be required prior to licensing, nor is it clear how the information would be used when it is obtained. Will results of these studies be used to modify the applicant's mitigation after licensing? The applicant must show that full restoration of fish, shellfish, and wildlife resources can be achieved under its proposal.

7. ECONOMIC EVALUATION

DOI-7 In general, we find the economic analysis components of the DEIS to be incomplete and misleading. The derivation of some figures (for example Capital and O & M Costs in Table 5-7), is not clear. Many additional costs are not shown nor mentioned in this summary table, or in cost comparison tables throughout the document. These additional costs include, but are not limited to, the costs of all FERC staff recommendations (such as conventional screening at the Elwha Dam, Elwha fish ladder design improvements, etc.), projected costs (or savings) for Ediz Hook maintenance, and, at a minimum, a description of the non-developmental costs (or benefits) associated with each alternative. Additionally, the total costs of removing both dams should not be described as based on the costs of 50 years of foregone power. Neither the applicant, nor any other entity, is entitled to revenues from this power. Additional suggestions follow:

DOI-8 a) Although no dollar figures are available, non-developmental "costs" should be presented alongside developmental costs in all tables. Section 2.7.2 notes that "Because of the absence of generally accepted methodologies, no attempt was made to assign dollar estimates to non-developmental values such as fish production, recreational use, terrestrial resources, or aesthetics." We agree that economic evaluation of these parameters, without lengthy and elaborate study, would be imprecise and speculative. However, these are primary resource values, equally important as the more quantifiable developmental aspects of this issue. Attempts to compare costs of the alternatives are incomplete and biased without at least a qualitative assessment of non-developmental values affected under each of the alternatives.

DOI-9 b) The use of "foregone power revenues" in the FEIS should be deleted. At a minimum, this concept, projected as costs over a 50-year period, is misleading without a similar projection of the "costs" of foregone natural and cultural resources over the same time period. The projection of foregone power revenues is inappropriate since it presumes some degree of entitlement to these revenues. Under current circumstances and law, authorization of the projects is in dispute.

DOI-10 c) Effects of the recycling facility on net power costs should be incorporated in the economic analyses.

DOI-11 d) Tables showing costs of the alternatives should be consistent in providing the costs in terms of dollars for a specified year.

8. BASELINE

DOI-12 The DEIS references current conditions as a "baseline" to which all alternatives are compared. For example, the preliminary findings section (5.6) States "the applicant's proposal...would result in meaningful improvement over current conditions with respect to fish and wildlife." Evaluation of alternatives against current conditions is entirely inappropriate. This approach ignores cumulative impacts and all past damages.

9. HABITAT CONCERNS

DOI-13 In addressing the resource objectives, fish passage concerns receive a substantially greater emphasis than does restoration of habitat (spawning gravels, etc.). Restoration of fish habitat must also be ensured if fish restoration is to succeed. We recommend that additional consideration of fish

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DOI-7: Cost tables in the main text and in the appendices have been clarified. The cost of staff-recommended measures have been provided and reflected in the cost analysis of the applicant's proposal with supplemental measures.

DOI-8: The staff concurs that nondevelopmental values are equally important to the more readily quantifiable developmental values. Section 2.7.2 has been modified to emphasize that the comparative dollar costs must be considered in conjunction with the full range of environmental effects described throughout the EIS.

DOI-9: The staff concurs that nobody is "entitled" to the future output of the projects. Nonetheless, the loss of power from these projects would have to be replaced, and the cost of that replacement clearly constitutes a cost to society that merits full consideration alongside other costs. Since the replacement power has a defined dollar value, it has been included in the cost analysis.

DOI-10: Refer to response DOI-4.

DOI-11: The base year for all cost estimates and economic calculations has been indicated on cost tables.

DOI-12: It is the Commission's policy to assess the effects of alternatives involving existing projects in relationship to forecasted changes from present-day conditions. The identified effects are assigned a degree of significance by the staff on the basis of degree of effect and resource importance, both of which are assessed in the context of past and present developments and their previous impacts. In this proceeding, for example, fish and ecosystem restoration objectives have been elevated to their position of prominence due, primarily, to the past adverse impacts of the Elwha and Glines Canyon projects on anadromous fish runs and the integrity of the watershed within Olympic National Park In the absence of those past impacts, the proceeding would be directed at different resource objectives.

DOI-13: The staff believes habitat has been sufficiently addressed.

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DOI-13 cont'd habitat be presented in the FEIS. Further comments are offered under technical comments.

10. CULTURAL RESOURCES
The DEIS is incomplete in its description of the archeological survey of the shorelines of Lakes Aldwell and Mills and the Elwha River. Based on the archeological reports, the FEIS should summarize the methods of survey and adequacy of ground coverage for each area and should include representative photographs of the landscape of the project areas. It should also include maps indicating the boundary of the archeological survey and the various levels of coverage.

DOI-14 In reference to the alternative of removing one or both dams, the FEIS should discuss what steps will be taken to identify, evaluate and treat cultural resources that will be exposed to erosion.

Mitigation needs for the various alternatives should be discussed with the State Historic Preservation Office in Olympia, Washington ((206) 753-4011). For information on HABS/HAER recording appropriate to these alternatives, contact the National Register Programs Division (attn: Ann Huston), Western Regional Office, National Park Service, 600 Harrison Street - Suite 600, San Francisco, California 94107-1372 or call (415) 744-3916.

The FEIS should more extensively discuss Religious and Traditional Cultural Resources and use areas.

11. RECREATIONAL RESOURCES
The description of existing recreational features and uses on the Elwha River does not provide enough detail to fully evaluate the consequences of the alternatives. The most significant omission is the lack of data on the number of users by recreational activity on the river and in the river corridor. The creel survey data presented to document fishing use is out-of-date and was gathered at the project reservoirs and in the middle river only, and appears to seriously underrepresent current fishing activity on the river. Other activities, such as noncommercial whitewater boating and camping in campgrounds, have no user counts whatsoever.

DOI-15 The FEIS would also benefit from additional discussion of the recreational opportunities on the Elwha River in comparison with other rivers on the Olympic Peninsula. Additional analysis would have indicated that the Elwha River provides several unique recreational opportunities. The river is the only late season Class II-III boating run on the peninsula, and consequently, is extremely important for commercial and noncommercial whitewater use.

Additional information on existing recreational facilities would assist analysis of the impacts of all alternatives. While it is possible to winnow information regarding facility design, capacity, and existing use from the text, simple maps and tabular information would expedite the review and analysis of the document. We recommend inclusion of this information in the FEIS.

12. DAM REMOVAL AND SEDIMENTATION
DOI-16 The description of the steps to be taken to carry out the three alternatives that would involve removal of one or both of the dams provides considerable detail. Design of the actual removal processes would require additional data gathering and specific measures for assuring minimal environmental damage during and after the removal.

DOI-17 The water quality and sedimentation impacts presented for the project alternatives are well described and should provide adequate comparative information for public consideration. Additional detail regarding the scope of mitigation (or staff recommended measures) would be helpful in evaluating the effects of the dam removal alternatives.

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DOI-14: It is inappropriate in an EIS to describe archaeological survey methodology in detail. The Archaeological and Historical Resources Report attached to Exhibit E of the license application is a part of the public record and has been accepted by the Washington Office of Archaeology and Historic Preservation and the National Park Service.

Sections 4.2.9.3, 4.3.9.3, and 4.4.9.3 recommend monitoring of reservoir excavation and dredging to determine whether the work is affecting archaeological sites. These sections also recommend halting work in the immediate vicinity and contacting the SHPO if the monitor discovers a site.

The staff has discussed mitigation with SHPO and the NPS.

See response EKT-2.

DOI-15: The staff has not identified any comprehensive statistics of the river corridor for the Elwha River. River user counts are only available for commercial whitewater rafting. Creel surveys have not been done on regular basis, but the data are useful although surveys have not been done recently. A summary of relative campground use at the various campgrounds in the area has been added to Section 3.7.8. An additional description of the whitewater boating resource has been added in Section 3.7.2. A map showing the recreational facilities of the Elwha River is found in Section 3.6.2 (Figure 3-15) and Section 3.7 1 (Figure 3-16).

DOI-16: Comment noted; the staff concurs.

DOI-17: Comment noted; additional detail on construction methods has been included in Appendix A.

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DOI-18

23. COUNCIL ON ENVIRONMENTAL QUALITY REFERRAL

Because of the fishery resources at stake and depending on the preferred alternative selected in the FEIS, the FWS may request that the Department refer this project to the Council on Environmental Quality under section 1504 of the Council's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.

We hope these comments and recommendations will be of assistance to you.

Sincerely,

Jonathan P. Deason
Director
Office of Environmental Affairs

Enclosure

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DOI-18: Position noted.

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TECHNICAL COMMENTS

GLINES CANYON/ELWHA PROJECTS

DOI-19
Page xxxiii., Paragraph 4.:
The area affected by the projects is actually much more extensive than the first sentence of this paragraph implies. Elwha River chinook have far ranging ocean migration patterns which affect commercial and recreational fishing as far away as Alaska.

DOI-20
Page xxxiii., Paragraph 4.:
The last complete sentence should read, "ONP has been designated a Biosphere Reserve and a World Heritage Site by UNESCO." Other references in the DEIS (eg. p3-71), are made to the status of ONP as a World Heritage "Park". The correct designation is "World Heritage Site".

DOI-21
Page xxxiv., Paragraph 4.:
Winter steelhead restoration prospects under the applicant's proposal are presented as "excellent" but the subsequent analysis in the DEIS concludes that prospects are "good." This section of the Executive Summary should be corrected in the FEIS to reflect the actual chances of restoring this stock. The ONP biologists rate the prospects for restoring winter steelhead as "fair" (see comments regarding page 5-5, Section 5.1.1).

DOI-22
Page xxxv., Paragraph 2.:
The FEIS should point out that the inability to restore pink and chum salmon under the applicant's proposal will result in a significant shortfall in restoring natural conditions within ONP. Pink salmon were by far the most abundant of the anadromous fish stocks returning to the Elwha River. Chum salmon which returned to spawn later in the season than the other salmon stocks provided an important source of food to wildlife when other food sources would be declining in abundance. As noted in the DEIS, the failure to restore chum salmon runs under the applicant's proposal severely limits the opportunity to restore conditions favorable to wintering bald eagles.

DOI-23
Page xxxvi., Paragraph 3.:
Although no smolts could migrate down through the construction area, several salmonid species have extensive freshwater rearing requirements which would allow them to be planted prior to the final year of the construction period. Steelhead rear in freshwater for two years while coho and sockeye remain in the river or lake for one year before smolting. This would allow outplants of these species to begin in the third and fourth construction years, respectively, instead of after the five year construction period as indicated in this paragraph.

DOI-24
The DEIS presents and overly pessimistic outlook with regard to the release of sediment during and following dam removal. Except in the event of massive slope failures within the areas now occupied by Lake Mills and Lake Aldwell, the DEIS largely describes the impact of turbidity and sedimentation as moderate. Additional measures could be included, such as armoring the restored channel banks to further reduce the probability of slope failure. Some insight on the potential for recovery can be gained from the South Fork of the Toutle River, which received an estimated 5 to 10 million cubic yards of fine sediment during the 1980 eruption of Mt. St. Helens. Sediment control efforts proposed for the Elwha River would be much more intensive than the measures implemented on the South Fork of the Toutle River. With this in mind, it is important to note that steelhead spawner density returned to at least pre-eruption levels in 2 to 3 years following the eruption and continue at this high level.

DOI-25
Page xxxvi., Paragraph 6.:
The low cost power presently received by the Daishowa Mill would be lost even under the dam retention alternative. Yet this fact is not presented in the Executive Summary until the dam removal alternative is discussed. Since the loss of the mill's cost advantage is common to all the alternatives, this fact should be discussed in the beginning of the Executive Summary.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-19: The staff concurs, but to modify the referenced sentence would not help the lay reader conceptualize the projects' primary impact area.

DOI-20: The National Park Service's undated publication entitled *Olympic National Park Biosphere Reserve and World Heritage Park* indicates that the World Heritage designation refers to "Park" rather than site. However, the staff has revised the text in Section 3.6.1 to reflect the proper term for the designation.

DOI-21: The text has been changed in the Executive Summary. The staff has retained the original assessment plus modifications because of reassessment of passage and harvest.

DOI-22: The text has been changed in the Executive Summary.

DOI-23: The text has been changed in the Executive Summary.

DOI-24: Comment noted.

DOI-25: The Executive Summary has been rewritten based on revised cost of power calculations and other revisions.

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DOI-26

Page 1-3:
A section detailing the circumstances leading to the decline of the Elwha River's anadromous fish runs, starting with the construction of the Elwha dam and continuing to the present, is needed. While most of this information is presented in the DEIS, it occurs in a number of sections which makes it more difficult to follow.

DOI-27

Page 1-6., Paragraph 3.:
This paragraph relates that the Northwest Power Planning Council, the Pacific Fishery Management Council and the Pacific Salmon Commission consistently stress restoration of wild, self-sustaining salmon stocks as a first priority. It should also be noted that most of the Elwha River watershed lies within ONP, and that FWS and NPS policies are directed exclusively to the protection/re-establishment of wild, self-sustaining fish populations. NPS policies also prohibit ongoing or supplementation planting programs the purpose of which is the maintenance of habitually overharvested fish populations.

DOI-28

Page 1-6., Paragraph 5.:
The FWS concurs with the emphasis on wild anadromous fish restoration as a major objective while placing a lower priority on commercial, and sport fisheries during the rebuilding of these runs.

DOI-29

Page 1-7., Paragraph 1.:
We concur that restoration of the Elwha River Basin ecosystem within ONP is a primary resource objective. Please note that inherent in this objective are needs to: 1) restore habitat for fish and wildlife (including restoration of spawning gravels, native vegetation, and elk winter range), 2) restore all species and stocks of anadromous fish, and 3) restore ecological processes which includes both physical and biological processes.

DOI-30

Page 1-7., Paragraph 2.:
We concur that natural ecosystem restoration will require the restoration of all species and stocks of anadromous fish which historically utilized the Elwha River drainage within ONP. Diversity in the timing and distribution of adult spawners throughout the watershed is essential to provide fish carcasses, eggs, and juveniles to a variety of habitats and wildlife communities. For example, coho and cutthroat spawn and rear in small headwater streams and provide fish carcasses, eggs, and juveniles to a large number of wildlife species which do not migrate widely. Spring chinook would utilize the headwaters at a time of year when few other anadromous fish are present in the system. Restoration of all the river's anadromous fish species would provide an almost year-round source of fish to the recreational and commercial fisheries, as well as carcasses and nutrients to the ecosystem.

DOI-31

Page 1-7., Paragraph 5.:
Recommendations of the Leopold Report and the report of the Commission on Research and Resource Management Policy form the basis for ecosystem management policies of the NPS but do not state the "primary goal" of the NPS as this sentence declares. The primary goal, taken from the act which established the National Park Service, is to:

> promote and regulate the use of the Federal areas known as national parks, monuments, and reservations...by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. (16 U.S.C. 1)

A primary management objective for national parks is perpetuation of natural processes, not preservation of a natural system as though frozen at a given point in time (Management Policies, 1988).

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-26: The appropriate location for a description of the existing environment in the context of historical fish run declines is Section 3.4, where the information appears.

DOI-27: The details of the Olympic National Park Service's goals are not needed and the general goals are covered in Section 1.4.2.

DOI-28: Comment noted.

DOI-29: Section 1.4.2 has been changed to include three principal components of the ONP Ecosystem Restoration goal. These components include restoration of: (1) anadromous fish runs; (2) the vegetation and habitats in the area currently occupied by Lake Mills and the Glines Canyon Project facilities; and (3) the natural river hydrology and aquatic ecosystem.

DOI-30: Comment acknowledged.

DOI-31: Section 1.4.2 has been modified to clarify the primary goal and primary management objective of the NPS in park management.

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DOI-32

Page 1-9., Paragraph 4.:
The DEIS indicates that regional firm energy sales totaled 15,618 MW in 1987, and is projected to reach 29,223 MW by 2010. To put the relative contribution of the Elwha River projects in the same perspective with these figures and with those presented in Table 1-1, it would be useful to indicate how much of the 19 MW annual average generation is considered to be "firm" power.

DOI-33

Page 1-11., Paragraph 3.:
Presenting the effect of removing the two projects on the region's energy supply as a percentage of the region's supply would be more informative than describing the reduction as "a small extent."

DOI-34

Page 1-11., Paragraph 5.:
A discussion of the impacts of alternative energy sources should include more than fossil fuel use. The Northwest Power Planning Council has emphasized conservation as having the highest potential for meeting new power requirements. To be complete, this section should include discussion of the environmental effects of conservation measures and other power generation possibilities.

DOI-35

Page 2-1., Paragraph 4.:
This sentence should also state that 90 percent of the Glines Canyon reservoir inundates ONP lands.

DOI-36

Page 2-11., Paragraph 2.:
The design of the Elwha fish ladder, as proposed by the applicant, includes a combination of pool-and-weir and orifice section and a Denil section. The FWS does not support the use of Denil type ladders in applications where debris can interfere with the effectiveness of the ladders. The Denil style ladder is very susceptible to being plugged with debris and requires a high level of maintenance.

DOI-37

Page 2-11., Paragraph 3.:
The Eicher screen is still unproven technology for effectively screening all size classes of fish from the turbine intake. While studies conducted by the applicant's consultant indicate favorable results with juvenile coho salmon, it should be noted that saltwater challenge tests have not been conducted. The effect of scale loss on survival in saltwater has yet to be evaluated. This is of significant concern because Elwha Dam is less than 5 miles upstream from the Strait of Juan de Fuca, and smolts could easily reach saltwater in a few hours.

The effectiveness of Eicher screens at protecting salmonid fry is uncertain. No tests using fry have been conducted, even though such tests have been requested by FWS and others.

DOI-38

Page 2-12., Paragraph 2.:
While the Elwha project would continue to operate in a run-of-the-river mode, it should be noted that flow fluctuations in the lower river will mimic whatever flow releases are made from the upstream Glines Canyon project.

DOI-39

Page 2-12., Paragraph 3.:
The 10-year period of broodstock collection and outplanting proposed by the applicant is insufficient to ensure restoration of the river's fish resources. It is unlikely that passage programs would be successful immediately and this would limit initial restoration efforts. We concur with the staff recommendations on page 4-36 and 4-37 which would require the applicant to continue restoration efforts until naturally-spawning populations of anadromous fish are restored to the watershed. The commitment should be for the entire term of the license.

DOI-40

Page 2-13., Paragraph 2.:
Boat launch site improvements are not described in Appendix A, Part 1. Please provide a description of the proposed improvements in the FEIS. ONP would not support substantial improvements of the launch site.

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DOI-32: The projects provide 8.5 MW of firm power.

DOI-33: The loss of the projects would result in the loss of 19.6 average MW, or about 0.1 percent of the region's firm energy sales.

DOI-34: Section 1.4.3.2 addresses coal-fired generation and its environmental impacts, because coal-fired generation represents a swing resource in the region having considerable adverse impact. It is the existing generating resource that would likely be adjusted to accommodate sudden changes in the region's generating resource base.

The environmental effects of other conservation and generating resources available to the region are discussed in Section 4.5.1.

DOI-35: Land management and administration are described in Section 3.6.1.

DOI-36: Comment noted.

DOI-37: This is a description of the facilities, not an evaluation. See Appendix B for a discussion of facility effects.

DOI-38: See text changes to Section 2.2.1.2.

DOI-39: Comment noted. The period was not designated; however, the costing was assumed for 20 years.

DOI-40: The improvements to the boat launch site on Lake Mills are not substantial and are described in Section 4.1.6.2. Also, in Appendix A, Section 1.2.1 and Figure A-7 indicate the extent of improvements as related to fish passage facilities construction.

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DOI-41

Page 2-13., Paragraph 4.:
The applicant's proposal to release 100 cubic feet per second (cfs) over the Glines Canyon Dam spillway for fish passage may be insufficient to attract juvenile salmonids to this exit. Studies by Wunderlich et. al. (1989) indicated greater attraction to this exit as spill increased (minimum spills tested were 130-175 cfs). There may also be injury to outmigrants at this relatively small gate opening. At 100 cfs, the opening under the gate through which the juveniles must pass is less than three inches. Velocities are also very high at normal pool elevations and it is very unlikely that steelhead, cutthroat, or Dolly Varden kelts would survive passage through this exit. If attraction is low at the level proposed by the applicant, greater delay and reservoir-related mortality would result. These uncertainties should be noted in the FEIS.

DOI-42

Page 2-13., Paragraph 5.:
The reservoir drawdown of 10 feet between Labor Day and Memorial Day proposed by the applicant may adversely affect juvenile and adult passage at and below Glines Canyon Dam, and should be noted in the FEIS. Drawdown and refill as proposed by the applicant may capture freshets that induce both downstream and upstream migrant passage. Nearly all juvenile exit selection data described in the DEIS for Glines Canyon Dam was measured under run-of-the-river conditions (the only important exception was the temporary drawdown of Lake Mills during late summer of 1989, and only limited spilling occurred during this drawdown). Deviation from run-of-the-river could reduce effectiveness of spill for passing migrants at Glines Canyon Dam, and render previous measures of juvenile exit selection inappropriate for describing juvenile passage. The peak passage period for both coho and steelhead smolts occurs prior to Memorial Day, so 10 foot drawdowns during peak migration makes these species particularly vulnerable to changes in river flow. Reducing freshets may also cause additional delay and mortality among adult migrants below the Glines Canyon Project.

DOI-43

Page 2-14.:
The ramping rates presented in Table 2-4 may not provide adequate protection for juvenile fish or aquatic invertebrates. Because of the existing degraded conditions in the lower and middle reaches of the Elwha River, and the very depressed populations of certain fish stocks, it is not presently possible to conduct studies to evaluate the effectiveness of the proposed ramping rates. Ramping rate studies conducted on the Sultan River indicate that even at the most restrictive rate (2 inches per hour), some stranding of juvenile fish still occurred (Olson, 1990). If gravel augmentation is included as a mitigative measure, the Elwha River channel could contain more gravel bars where the potential for stranding would be greater. The ramping rate schedule ultimately needs to be based on actual data.

DOI-44

Page 2-16., Table 2-5.:
This table (also Table 2-7, page 2-23; Table 2-8, page 2-24; Table 2-9, page 2-25; and Table A-23, page A-103) lists $3,070,000 for fish restoration (identified in Appendix A as facility costs), and $240,000 for recurring fish restoration costs (identified in Appendix A as initial outplanting costs). An explanation of how these figures were derived and what they include should be included in the appendix of the FEIS.

DOI-45

Page 2-29., Paragraph 7.:
It is stated in the DEIS that "...no attempt was made to assign dollar estimates to non-developmental values such as fish production, recreational use, terrestrial resources, or aesthetics..." because generally accepted methodologies are lacking. However, a non-monetary approach should be developed and presented in a separate section to balance the DEIS section on "Economic Evaluation of the Applicant's Proposal and Alternatives." Restoration of the Elwha River fish and wildlife resources is certain to provide significant economic benefits to the Port Angeles area. These benefits should at least be discussed in non-monetary terms.

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DOI-41: See Appendix B and Section 4.1.3.3 for supplemental recommendations to applicant's proposal.

DOI-42: See Section 4.1.3.3 for supplemental recommendations to applicant's proposal.

DOI-43: These ramping rates were acceptable at another project in Washington and were the rates recommended by the agencies for this project. Until site-specific studies show otherwise, these rates are considered acceptable. However, in the applicant's proposal with supplemental measures, a run-of-river operation would reduce this occurrence.

DOI-44: The estimated costs for fish restoration have been revised, and supporting information can be found in Appendix A, Part 7

DOI-45: Staff disagrees that another section is needed to balance the cost evaluation of the alternatives. Section 4.0 is entirely dedicated to describing the nondevelopmental values associated with the alternatives. Section 5.0 also summarizes the effects of each alternative in terms of both non-developmental and developmental values.

DRAFT REPORT

COMMENTS OF DEPARTMENT OF INTERIOR

Page 3-1., Paragraph 2.:
This paragraph should also note that the Elwha River basin is the largest watershed within ONP.

DOI-46 The description of the Glines Canyon and Elwha Projects as "near run-of-the-river" should be qualified. While the existing agreement between James River II and the Washington Department of Fisheries (WDF) requires only the Elwha Project to be operated run-of-the-river, there have been significant deviations from this flow regime in the past. Additionally, the Glines Canyon Project is not currently operated in this manner and the applicant has proposed to fluctuate Lake Mills up to 10 feet during certain portions of the year which would make it impossible to operate the Elwha Project as run-of-the-river.

Page 3-7., Paragraph 2.:
DOI-47 The statement, "the lower Elwha channel has...active point bars and side channels," is misleading by its implication that the morphology and processes of the lower river are similar to what would be expected in a system which is not sediment starved. While some point bars and side channels occur in the lower river, it is inaccurate to characterize the lower river segment in those terms.

Page 3-11:
The information presented in Figure 3-6 clearly shows the impact that the dams have had on channel substrate, particularly the loss of streambed elements that are generally preferred by anadromous fish. The much larger substrate that presently exists below each of the dams (about twice the median diameter when compared to the upper river) is even more telling of the effects of the dams when the channel gradient is considered (i.e. hicher gradient, larger substrate). Just the opposite now occurs. The lower reach has an average gradient of 0.4 percent compared to an average gradient of 0.8 percent, and 1 percent to 3 percent in the middle and upper reaches, respectively.

DOI-48 Because of the importance of suitable substrate for spawning to the restoration of the anadromous fish runs, an analysis of the sediment transport factors to predict future substrate conditions should be presented in the final document. If possible, the conclusions should be presented over a 30 to 50 year timeframe and under several flood flow scenarios, in median grain size, similar to the depiction in Figure 3-6. Will the substrate coarsen, and how quickly can it be expected to occur under various flood flow frequencies and magnitudes? The FWS has concerns that spawning and rearing habitat in the lower and middle reaches will continue to degrade in the absence of any gravel augmentation measures.

The potential for gravel augmentation should also be examined from the basis of sediment transport. How effective would the additions of gravel be at reducing substrate coarsening and armoring? How much gravel (1/2 to 3 inches) would be needed? How quickly would it be transported through the system under both normal and extreme flow conditions? How frequently would gravel additions be needed?

Page 3-16., Paragraph 5.:
DOI-49 Little River is not completely affected by logging activities as this paragraph implies; it also drains undisturbed national park lands.

Page 3-21., Paragraph 4.:
DOI-50 The DEIS is limited in its presentation of the effects that project-related low flows have had on the Elwha River's anadromous fish runs. There are many occurrences of large changes (1000 cfs to less than 50 cfs) in river flow during the fall spawning period caused by project operation (1928 to 1944). Flow changes of this magnitude would have had a serious impact by dewatering redds and stranding juvenile fish. Concern about artificial low flow conditions was one of the main factors leading to the agreement between the Washington Department of Fisheries and the Crown Zellerbach Corporation. A summary of daily low flow occurrences caused by project operation would be helpful in explaining the projects' impact and decline of the anadromous fish runs. FWS recommends that the FEIS contain a table listing all flows and the date of occurrence when project operation caused the river flow to drop to less than 100 cfs.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-46: The DEIS has been revised to indicate that only the Elwha Project is operated as run-of-river. Water-level fluctuations of up to 10 feet in Lake Mills under the applicant's proposal would preclude the Glines Canyon Project from being considered a run-of-river project.

DOI-47: Comment noted; the text has been changed in Section 3.2.5. The lower river has active point bars due to the addition of sediment from the eroding high banks. All of the point bars in the middle and lower reach are active during flood flows, but not as active as they would be with the natural sediment supply.

DOI-48: For the dam retention alternatives, the staff estimates that substrate would remain about the same as it is now. The channel is about as armored as it can get. The middle and start of the lower river channel receive new channel substrate only from limited reworking of the alluvium stored along the channel banks. The lower channel receives some additional sediment from the high outwash banks. The amount of spawning gravel (fine gravel [8 mm] to cobbles [128 mm]) stored in the Lake Mills and Lake Aldwell deltas is estimated at about 1.68 million cubic yards This is equal to a 77-year average yield of about 22,000 cubic yards per year. It must be noted that the bedload transport rate is strongly motivated by the duration of the larger floods and the watershed supply to the river channel, so in any given year the yield in the channel would vary greatly.

Predicting the channel substrate conditions over time for the various alternatives is best accomplished by comparison to the upstream reaches and other rivers in the region. If the dams were removed the gravel and sand supply would return. The channel substrate would return in an estimated 4 to 6 years to conditions similar to upstream reaches if the reservoir sediment stabilization is successful. This recovery period is based on general periods for rivers to recover from large sediment sources once the source is reduced to typical background levels.

Dumping washed gravels on selected flood bar edges for redistribution along the channel by flood flows has not been tried on a large scale in salmon rivers. Sediment nourishment is often used along coastal areas where natural sediment supplies have been cutoff or reduced as in the Ediz Hook area.

For an Elwha gravel nourishment program, the material would be supplied by a local batch washing plant. The gravel would need to be supplied on an annual or semi-annual basis at an estimated cost of $500,000 to $700,000 per year assuming an average 20-mile round trip hauling distance. Annual gravel and spawning surveys would be required to assess the results of the gravel introduction program.

DOI-49: Comment noted.

DOI-50: The staff does not believe the detail requested will add substantially to the document. Historical conditions that might have caused problems in the past have not occurred recently and are not proposed for the future. Also, these conditions are not occurring under current operation agreements.

COMMENTS OF DEPARTMENT OF INTERIOR

DOI-51

<u>Page 3-24., Paragraph 4.:</u>
The FWS concurs that Lake Mills and Lake Aldwell contribute to the warming of the lower river and that this warming contributes to the occurrence of <u>Dermocystidium</u>. However, the effects of the two reservoirs are more than just contributors to the <u>Dermocystidium</u> problem, as implied in this section. In the absence of the dams, we doubt that the conditions for the disease organism to reach epidemic levels would have occurred. We are unaware of any river lacking an impoundment within Washington State where <u>Dermocystidium</u> has caused fish mortality.

DOI-52

<u>Page 3-28., Paragraph 2.:</u>
Other fish species reported in the Elwha River were sturgeon and smelt. Dick Goin, a local sportsmen and expert regarding history of Elwha River fisheries, reports observing both of these species in the river historically.

DOI-53

<u>Page 3-28., Paragraph 3.:</u>
The existence (or lack) of sockeye salmon in other Strait of Juan de Fuca streams has no bearing on the historic existence of sockeye in the Elwha River drainage. The limiting factor for sockeye is the presence of an accessible lake. Evidence of sockeye in the Elwha River watershed is provided by kokanee (landlocked or resident sockeye) in both Lake Sutherland and Lake Crescent, (these two lakes were connected to the Elwha River via Indian Creek before a large land-slide separated them and isolated Lake Crescent). Although kokanee have been planted into both lakes, Hagen (1960) quotes a Port Angeles resident (Mr. Carrigan) who recalls large schools of kokanee in Lake Crescent in 1896, well before any stocking occurred. Garlick (1949) also discusses the early existence of kokanee in Lake Crescent.

DOI-54

<u>Page 3-28., Table 3-5.:</u>
As noted on page 3-27, Table 3-5 represents the results from several techniques used by the Joint Fish and Wildlife Agencies for estimating potential fish production. To use these techniques, it was necessary to make certain assumptions on the habitat that would be used by each species. For example, under the dam removal option, it was assumed that pink and chum salmon would only use the river stretch downstream from Rica Canyon because of the presence of cascades. This assumption may be overly conservative because the only assessments of fish passage (Washington Department of Fisheries, 1970; Hosey and Associates, 1987) were done during low-flow periods for safety reasons. Passage conditions would be substantially improved at higher flows, as was stated in the Washington Department of Fisheries report. Our review of the U. S. Geological Survey river flow data indicates that significantly higher flows than those which were observed during the two assessment periods are typical. Consequently, significantly more habitat may be accessible to pink and chum salmon than presently assumed for the production potential estimates.

The upper estimate for coho salmon production involved an estimate of available habitat which was based on a survey conducted by the applicant's consultant, Hosey and Associates. However, the survey was conducted during an extremely critical low-flow period (an estimated 100 year recurrence interval). Although Hosey and Associates adjusted the results by 7 percent to reflect the wider channel width that would be expected during "normal" year flow conditions, no adjustments for length were made. Small tributaries that were found to be dry during this exceptionally dry period did not figure into the estimate of available habitat even though it is likely that many would be watered and provide coho habitat during more typical summer low-flow periods.

Follow-up field studies should be conducted to more accurately address the potential upstream limit for pink and chum salmon, and to more precisely quantify available habitat for coho salmon. In the absence of this information, it should be acknowledged in the FEIS that the upper estimates for pink, chum, and coho salmon are likely to be conservative.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-51: Comment noted. *Dermocystidium* has been observed in an undammed coastal river in Oregon, but to staff's knowledge, not in Washington. The presence of this disease in an Oregon coastal stream suggests the elimination of reservoirs is not a guarantee that the disease would not be periodically epidemic.

DOI-52: Section 3.4.1.1 has been modified.

DOI-53: The two members of the Lower Elwha Klallam Tribe that resided and fished on the river before dams were in place mentioned trout and all major stocks of salmon, except sockeye. Not mentioning such a highly valued fish seems unreasonable, if it was present, and in the staff's view is strong evidence that sockeye production is highly unlikely in the lake. The production of sockeye in Northwest systems is uncommon. There are only three lakes (Baker Lake, Lake Quinault, and Lake Ozette) with native sockeye stocks of significance in western Washington and on the Washington coast. This indicates that, unlike other salmon and steelhead stocks, their occurrence is rare even if a lake is present.

DOI-54: Some changes were made to Table 3-5. While follow-up field surveys might more accurately define the total habitat usable for anadromous stocks, the accuracy of the estimates of potential production are not likely to be improved considering the other factors (e.g., density of spawners per mile, density of smolts per unit stream area or length, number of smolts per adult, smolt to adult survival, and stock production characteristics), beside habitat, that affect the estimates of potential production. Also, the results of such a survey would have little influence on the overall evaluation of the projects. For these reasons, the staff does not recommend additional surveys. See response DOI-53.

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DOI-54 cont'd

The DEIS questions whether sockeye salmon historically used the Elwha River and Lake Sutherland. The failure of two Lower Elwha Klallam Tribal members to mention fishing for sockeye salmon on the Elwha River as well as the statement that no other Strait of Juan de Fuca stream system has sockeye salmon is an inadequate argument for stating that sockeye salmon were not indigenous to the Elwha River. At the time that tribal testimony was given in 1977, sockeye salmon runs would have been eliminated for 65 years, owing to their requirement for a lake for rearing. Regarding the absence of sockeye salmon in any Strait of Juan de Fuca stream system, only the Elwha River has a lake within its drainage that would have been accessible to sockeye salmon.

The presence of kokanee in Lake Sutherland provides supporting evidence that sockeye salmon were historically present in the Elwha River before the construction of Elwha Dam. Old accounts of "kokanee" being present in Lake Sutherland prior to the earliest stocking records suggests that Lake Sutherland may contain fish retaining the genetic attributes of the former Elwha sockeye salmon.

DOI-55

Page 3-29., Paragraph 2.:
The conjecture that the Elwha River was a "harsh environment", particularly in the middle and upper reaches, is an unsupported, subjective evaluation which implies marginal conditions in the river. Any inferences based on this subjective evaluation regarding fish restoration potential are entirely inappropriate in an objective, decision-making document, particularly when evidence exists to the contrary. Steelhead fry planted into the upper river in 1983 experienced outstanding survival to the smolt stage (Wunderlich 1988).

DOI-56

Page 3-29., Paragraph 5.:
We do not object to the use of river mile 16 as the upper limit for pink and chum salmon however, it should be noted that this is a conservative limit of distribution. For example, in the Lyre and Dungeness Rivers pink and/or chum migrate through steep canyon areas to upper river spawning areas. We believe the actual upstream limit of pink and chum in the Elwha River might have been beyond river mile 16 and the FEIS should note this possibility.

DOI-57

Page 3-31., Paragraph 1.:
Although spring chinook from the Soleduck and Dungeness Rivers were each planted into the Elwha River in one year, it is doubtful that these individual plants of non-native stock had a significant influence on the genetic composition of native remnant stocks in the river. Had these plants occurred over a number of years, their influence may have been much greater.

DOI-58

Page 3-31., Paragraph 6.:
Although there have been some very restricted test and evaluation fisheries, there have been no directed chinook fisheries in the Elwha River for many years; nor has there been non-Indian fishing for adult chinook in the Elwha River. Contrary to the DEIS description of chinook harvest as "formerly restricted", this harvest is still restricted, and should be so-described in the FEIS.

DOI-59

Page 3-33., Paragraph 1.:
In the discussion of hatchery mortality related to Dermocystidium, it would be helpful to provide more detail than simply the average because of the implications to subsequent fish runs. For the period, 1980 to 1988, mortality at the Washington Department of Fisheries' Elwha facility was 35, 46, 8, 9, 4, 12, 36, 34, 31 percent, respectively.

DOI-60

Page 3-33., Paragraph 2.:
Although chinook are observed spawning in the lower Elwha River each year, there is little or no evidence that these fish are spawning successfully and producing viable fry. The majority of the fish spawning in the river are probably strays from the Elwha Rearing Channel. Large numbers of chinook are observed in the pool below Elwha Dam each fall. These fish are likely strays since there is no production above the dam and spawning habitat in the one-mile section below the dam is very poor (Hosey, 1988).

DOI-55: The text has been changed in Section 3.4.1.1.

DOI-56: The text has been changed in Section 3.4.1.2.

DOI-57: Refer to response NMF-21. The number of spring chinook planted was 166,000 in 1973 and 531,000 in 1977. Chinook typically return over a 3-year period, so the influence of each stocking could affect several years of spawning populations, particularly the latter. Considering that any native spring chinook stock could have been present in very low numbers at best, in this system, it would take very few returning fish to dominate wild run numbers. Based on the coded-wire tag data, few chinook returned from the initial planting, and the larger second group was not tagged, so their return numbers are not known. The presence of this stock and the other factors discussed in the text lead the staff to believe the statements made in the text are reasonable and should not be changed.

DOI-58: The text has been changed in Section 3.4.3.1.

DOI-59: The text has been changed in Section 3.4.3.1.

DOI-60: See text changes in Section 3.4.3.1. *Dermocystidium* is not related directly to spawning gravel discussions.

COMMENTS OF DEPARTMENT OF INTERIOR

DOI-60 cont'd

The 15-redds-per-mile figure for north coastal chinook is outdated and reflects conditions during a period when these runs were at a very low level. More recent estimates are available through the PFMC (1991).

We do not concur that spawning habitat for chinook salmon in the lower river is adequate solely because spawner density is higher than that found on other north coast Washington streams. Rather, the higher spawning density (spawners per mile) may reflect competition for the remaining suitable spawning areas and the presence of hatchery strays. Our primary objection to this section is the implication that spawning habitat in the lower river is adequate, without taking into account location and quality. The near absence of spawning in the 0.8 mile reach immediately below the dam may presently limit the rearing potential of this area, since fry would be required to migrate upstream from lower spawning areas. Furthermore, the crowding of spawners because of the reduction of good quality spawning habitat can be a significant factor in the spread of Dermocystidium, resulting in higher prespawning mortality.

DOI-61

Page 3-33., Paragraph 5.:
The Service concurs that spawning habitat in the middle reach is presently limited because of "unsuitably large substrate." It is likely that conditions will continue to degrade as high flow events further remove the smaller substrate elements. Whether gravel augmentation in the lower and middle reaches is feasible should be evaluated.

DOI-62

Page 3-34., Paragraph 2.:
In addition to Cat, Godkin, and 'elabarre Creeks, there is potential chinook spawning habitat in Boulder, Buckinghorse, Goldie, Hayes, Lillian, Long, Lost, and State of Washington Water Resource Inventory Area stream numbers 542, 544, 554, 633, and 635. The Goldie River in particular contains a significant amount of suitable chinook spa·ning habitat (approximately 4.7 miles) (Hosey 1988).

DOI-63

Page 3-35., Paragraph 4.:
Although coho rearing in the middle (and lower) sections may be limited by summer low flows, the lack of large organic debris (LOD) is also suspected as a constraint. Bilby (1987) lists several important functions of LOD; LOD forms pools, retains sediment and gravel, retains small organic matter used by invertebrates, and provides cover for fish. The removal of LOD changes a stream from a series of pools and riffles to primarily riffles. This alters the species composition and age structure of the fish populations to those favoring higher velocities. LOD also reduces stream energy, slowing the export of sediments and organic matter, as well as juvenile fish prior to smolting.

DOI-64

Page 3-37., Paragraph 4.:
The FWS concurs that hatchery outplants of coho, steelhead, and chinook salmon have a negative impact on pink and chum salmon stocks because of predation on the fry of these species. The fact that large numbers of pink and chum salmon were historically found in the Elwha indicates that predation was not limiting under natural production. The continued release of large numbers of coho and chinook salmon and steelhead smolts, in combination with the degraded conditions for spawning in the lower river, can be expected to contribute to the further decline of the pink and chum salmon stocks. It should be noted that artificial propagation measures would not have been necessary if the impacts associated with the dams had been fully mitigated at the time of construction.

DOI-65

Page 3-39., Paragraph 1.:
The conclusions stated in this paragraph are based upon Mr. Ray Johnson's observations in 1959-67 and 1988. Apparently Mr. Johnson believes that there has not been a decline in the quality of the spawning substrate from a time when pink escapements were reported to range from 8,000-15,000. We disagree. We believe that the poor quality of the substrate is the principle cause of the currently depressed status of pink salmon in the lower Elwha River (affidavit of Brian Winter, 1988). Scott and Crossman (1973) describe pink spawning substrate as "medium-sized gravel" which is very limited in the middle and lower Elwha River. A local expert on the history of Elwha River fisheries, Mr. Dick Goin, states

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-61: The gravel conditions are not likely to change significantly over the near or long term because most of the gravel conditions have already altered. See Section 4.1.3.3 for staff recommendations.

DOI-62: The text has been changed in Section 3.4.3.1.

DOI-63: Comment noted.

DOI-64: Although hatcheries might have been implemented because there was reduced access to upstream reaches for the fish, this does not change the discussion of the effects of the hatcheries on the stocks.

DOI-65: Jim Ames (personal communication, Washington Department of Fish, Harvest Management Division, Olympia, Washington, April 5, 1990) indicated that surveys of actual spawners on the Elwha were conducted before 1977; however, not all information was entered on the database for stream surveys.

Ray Johnson (personal communication, Washington Department of Wildlife, former District Fish Biologist, January 30, 1992) was familiar with the pink salmon runs on the Elwha during the early 1960's. He indicated that he did not see noticeable differences in the stream substrate between then and in 1988. The staff believes his experience and expertise makes his statement a valuable and credible assessment. Also, the major changes in substrate would likely have occurred before the early 1960's because gravel movement stopped upstream and there are only limited gravel supplies from the adjacent stream banks in the lower river that can supply input to the river.

Most gravel loss to the lower river would have occurred before the 1981 crash of pink salmon stocks, so this reduction cannot reasonably be attributed to the substrate composition.

The 1988 survey of the lower river spawning areas estimated that the lower river contained about 5,000 square yards of usable gravel for pink salmon spawning in the lower river. This is more than enough for the current low-run levels and supplies spawning area for a much larger run.

Additional less optimum substrate in the small cobble range (about 2.6 to 5 2 inches) is available in lower Elwha River. Raleigh and Nelson (1985) in their HEP models indicated that on a scale of 0 (not preferred) to 1 (most preferred), pink salmon have a preference of 0.6 for the 2.6- to 5 2-inch substrate, indicating that it can be used but is less preferred.

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DOI-65 cont'd

that spawning gravels in the river have noticeably declined since 1974; we concur with his observations.

We were unable to discover the basis for the 8,000-15,000 pink estimate of escapements into the river during the period, 1959-67. It appears that there were very few surveys on the Elwha River during this period according to the WDF Spawning Ground Survey Database. If the estimate is not based on Elwha River surveys and was based on other rivers, what information is available to indicate that the relationship between these rivers was consistent during the period of interest?

Figure 3-6 which depicts median grain size ranging from 3 to 6 inches at various locations downstream from Elwha Dam and the armored channel makes it evident that conditions for pink salmon spawning are presently highly degraded. While the FWS concurs that the degraded spawning conditions are not solely responsible for the low run size, we believe it is the main factor, along with smolt predation and high water temperatures, which prevents the rebound of this stock. Although high flood flows in December of 1979 may have been the catalyst for the precipitous decline, the continuing impacts of the projects seriously limit the resiliency of this stock.

DOI-66

Page 3-39., Paragraph 3.:
The FWS does not concur that "...pink salmon will probably not use the upper reach for spawning." The information on which this conclusion was based was collected during low flow periods that do not reflect a sufficient range of flows that pink salmon can be expected to encounter during their upstream migration. In fact, the surveys by both the Washington Department of Fisheries and Hosey and Associates were conducted at flows of 400 cfs or less. Assuming spawners enter the river during mid-July through September (page 3-37), our review of the McDonald Gage flow records indicates that pink salmon would have had migration flows in excess of 800 cfs for at least a few days in every year, and in some wetter cycles, flows exceeding 4,000 cfs. Flows exceeding 2,000 cfs at some time during this 10-week period are not uncommon. It is premature to conclude that pink salmon would not use areas upstream from Lake Mills, based solely on surveys conducted at flows less than 400 cfs.

Furthermore, we question the DEIS's citation of the 1971 Washington Department of Fisheries' report regarding pink salmon spawning within the area now inundated by Lake Mills. First, the DEIS substitution of "region above Glines Canyon dam" in place of "river inundated by Glines Dam" is an overstatement of the citation. Secondly, the context in which the Washington Department of Fisheries' statement was made suggests that it was made to appear reasonable in their request for mitigation for "unreplaced losses," rather than a substantiated assessment of historical spawning use.

DOI-67

Page 3-41., Paragraph 3.:
Our comments on pink salmon regarding predation, degraded spawning areas, and limits of migration also apply to chum salmon. However, since chum salmon migrate later (September through early December), a wider range of migration flows must be considered when evaluating their upstream limits. Flows between 1,000 cfs and 2,000 cfs are common, and significantly higher flows for short periods of time are not unusual. Furthermore, chum salmon are larger and stronger swimmers than pink salmon. Consequently, the conclusion that chum salmon would not pass Rica Canyon is even more uncertain.

DOI-68

Page 3-41., Paragraph 4.:
While the Elwha River no longer supports runs of sockeye salmon, it is possible that the genetic makeup of this former run has been preserved in the Lake Sutherland kokanee. If this is the case, the prospects for restoring runs of sockeye salmon would be improved over any scenario which involves introduction of a stock from another system. The FEIS should also note that screens exist at the outlet of Lake Sutherland, and these pose an additional migration barrier for sockeye upstream from Elwha Dam.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-66: See response DOI-65.

DOI-67: The text has been changed in Section 3.4.3.3.

DOI-68: The text has been changed in Sections 3.4.3.4 and 3.4.3.5.

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DOI-69 Page 3-46., Paragraph 1.:
Although many tributaries to the Elwha River are relatively steep, there are areas of "low gradient adjacent to meadowlands" which provide suitable cutthroat habitat. For example, Indian Creek currently provides excellent rearing habitat for several land-locked salmonids including cutthroat. Surveys by NPS and U.S. Fish and Wildlife Service biologists (1987) have identified cutthroat, coho (juveniles produced by an experimental plant of adults), brook trout, and rainbow trout in Indian Creek. Sampling at two sites revealed cutthroat to be the most abundant species.

DOI-70 Page 3-54., Paragraph 1.:
This section on Roosevelt elk needs revision. Winter densities of elk are around 15-19 elk per square mile. The correct estimates of density include all winter elk habitat, not just the valley floor census zone (see attachment: Houston, et. al., 1988, page 6, paragraph 2). The sentence beginning line 4 should read "Elk on the west side of the peninsula are primarily resident and mean winter densities range from 15/sq. mi. for the Hoh to 19/sq. mi. for the Queets (Houston, et. al., 1987, 1988).

DOI-71 In all personal communication attributed to B. Moorhead, and cited on pages 3-54 through 3-64, "Moorehead" should be spelled "Moorhead".

DOI-72 Page 3-54., Paragraph 4.:
ONP biologists question results of the Habitat Evaluation Procedure (HEP) conclusion that habitat quality for elk is low, particularly if this conclusion was drawn using the incorrect density figures discussed above.

DOI-73 Page 3-55., Paragraph 3.:
Replace sentence beginning line 2 and sentence beginning line 5 with the following: "Black bear density in ONP is thought to be high, however, no data on bear numbers are available (personal communication B. Moorhead, Biologist, ONP, Jan 25, 1990). Black bear density along the Elwha River may be lower than elsewhere in ONP because of the lack of salmon carcasses, which are known to provide food for this species in other drainages (Cederholm et. al., 1989)."

DOI-74 In addition to "(Woods, 1976)" a citation should be added "(personal communication B. Moorhead, Biologist, ONP, January 25, 1990)."

DOI-75 Page 3-55., Paragraph 4.:
Replace the word "throughout" with the word "in".

DOI-76 Replace sentence beginning line 6 and remainder of paragraph with the following: "The pine marten inhabits late successional coniferous forests, may be fairly common throughout ONP, and probably occurs in the study area. The fisher is rare and may be extinct on the Olympic Peninsula. The last reliable sighting of a fisher in the Elwha River drainage occurred in the Glines Canyon Project study area in 1975, just outside the ONP boundary near Herrick Road (personal communication B. Moorhead Biologist, ONP, Jan. 25, 1990)."

DOI-77 Page 3-56., Paragraph 2.:
Remove the term "with dense cover".

DOI-78 Page 3-58., Paragraph 5.:
Cotton's milk-vetch (Astragalus cottonii) is now listed as Astragalus australis var olympicus, a federal Category 1 candidate species. This species occurs in the Elwha River drainage at elevations above 5,000 feet. (Also see page 3-62).

DOI-79 Page 3-60., Paragraph 3.:
We concur that the loss of anadromy has had an adverse impact on the use of the middle and upper reaches of the Elwha River by bald eagles. We believe the low use of the lower reach by bald eagles is more likely related to low numbers of chum salmon and late spawning coho salmon, and to a lesser degree "... the loss of potential roosts, perch sites, and nesting habitat due to logging" as suggested in the DEIS.

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DOI-69: The text has been changed in Section 3.4.3.9.

DOI-70: Section 3.5.2.1 has been modified to reflect winter densities for roosevelt elk on the west side of the Olympic Peninsula.

DOI-71: The spelling of Moorehead has been changed to Moorhead in all appropriate references in Sections 3.5.2 and 3.5.3.

DOI-72: The conclusion that elk habitat quality in the study area is low was based on the results of the applicant's HEP, not the density figures presented in the text, which were for the Hoh and the Queets drainages. Using the HEP, optimal habitat quality for any species has an HSI of 1.0. The estimated HSI for elk habitat in the Elwha/Glines Canyon study area was only 0.19, primarily due to limited winter forage. ONP biologists were members of the HEP team and should recognize that this value represents habitat both inside and outside park boundaries and includes only a portion of the elk winter range in the Elwha drainage.

DOI-73: Section 3.5.2.1 has been modified to incorporate the changes in black bear density.

DOI-74: Section 3.5.2.1 has been modified to include an additional citation (personal communication, B. Moorhead, Biologist, ONP, Port Angeles, Washington, January 25, 1990) on mountain lion observations in the Elwha drainage.

DOI-75: Section 3.5.2.2 has been changed from "throughout ONP" to "in ONP."

DOI-76: Section 3.5.2.2 has been revised to include the date and location of the last reliable sighting of a fisher in ONP and the possibility that this species may be extinct on the Olympic Peninsula.

DOI-77: As suggested, the term "dense cover" was removed from Section 3.5.3.

DOI-78: Section 3.5.3 has been changed to reflect the correct Latin name of Cotton's milk-vetch and its change in status from a Category 2 Candidate species to a Category 1 Candidate species. In addition, the fact that this species is limited to elevations above 5,000 feet in the Elwha River drainage was added to Section 3.5.3.2.

DOI-79: The staff concurs that the low numbers of chum salmon and late spawning coho salmon are probably the primary reason for low winter use of the lower Elwha by bald eagles. The text of Section 3.5.3.1 was modified to include this rationale for low use.

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DOI-80 Page 3-60., Paragraph 5.:
Replace sentence beginning line 2 and sentence beginning line 3 with the following: "Two active nests were located, 8 juveniles observed, and 5 juveniles were banded. The two nests were located within 2.2 miles of the Elwha River and Lake Mills."

DOI-81 Page 3-61., Paragraph 1.:
Replace phrase, "...100 years old are not suitable spotted owl habitat..." with the following, "... 100 years old may not be suitable spotted owl habitat...."

DOI-82 Page 3-62., Paragraph 5.:
Replace sentence beginning line 1 with following: "The northern spotted owl and fisher are state listed as endangered, the bald eagle as threatened".

DOI-83 Page 3-67., Paragraph 3.:
Replace first sentence with the following: "The NPS lists 28 plants that receive special protection in ONP, within the park, some occur only within the Elwha River drainage."

DOI-84 Page 3-71., Paragraph 1.:
Replace sentence beginning line 1 with the following: "The upper half of the middle reach and most of the upper reach of the Elwha River are located on Federal lands administered by ONP".

DOI-85 Rewrite sentence beginning line 2 as follows: "...designations that recognize the exceptional qualities of the existing natural environment."

DOI-86 Rewrite sentence beginning line 6 as follows: "...effects of humans remain unnoticed, includes most of the Elwha River Valley except the project area and the road corridors."

DOI-87 Replace last sentence this paragraph with the following: "The World Heritage Site designation, made by UNESCO in 1981, recognizes the global importance of the park's ecosystems. The nomination stated, "...Olympic National Park is the best natural area in the entire Pacific Northwest, with a spectacular coastline, scenic lakes, majestic mountains and glaciers, and a magnificent temperate rain forest; these are outstanding examples of on-going evolution and superlative natural phenomena. It is unmatched in the world."

DOI-88 Page 3-71., Paragraph 2.:
Replace "in-holding", with "inholding" (here and throughout the text).

DOI-89 Public land ownership along the middle and lower reaches of the river is described as being shared by the U.S. Forest Service, Washington Department of Natural Resources, and Washington Department of Wildlife (WDW). Almost 75 percent of the middle reach of the Elwha River is within ONP, and most of this is in designated wilderness.

DOI-90 Page 3-78., Paragraph 1.:
The Resources Management Plan for ONP (second draft, May 1990) does address issues specific to the Elwha River drainage. Project Number N-802.00 is specific to the Elwha and Glines Canyon Project licensing proceedings, and calls for continued ONP staff participation in joint agency meetings, in fish and wildlife studies which may be needed associated with the licensing proceedings, in monitoring project effects or effects of any alternative selected during the licensing proceedings. The Resources Management Plan notes that restoration of the Elwha River ecosystem is a primary goal of ONP.

DOI-91 Page 3-80., Paragraph 4.:
Insert the following sentences after the first sentence of this paragraph: "The Elwha Valley is an important backcountry use area of the park. The Elwha River Trail connects with the North Fork Quinault Trail, forming one of the major cross-park trail routes."

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-80: The correct information on the numbers of spotted owls observed in between the headwaters of the Elwha and the ONP boundary were added to Section 3.5.3.1.

DOI-81: Section 3.5.3.1 has been modified, as suggested, from "are not suitable habitat" to "may not be suitable habitat".

DOI-82: According to the most recent list of state species of special concern (August 1992), the fisher has not yet been listed as state endangered and remains an unclassified species of special concern. Furthermore, WDW has no records documenting the occurrence of the fisher in the Elwha/Glines Canyon study area.

DOI-83: Section 3.5.3.5 has been modified to indicate that in ONP some of the 28 species found in low-elevation areas in the north-central portion of the ONP which are protected in the park, occur only in the Elwha River drainage.

DOI-84: Section 3.6.1 has been modified as indicated.

DOI-85: Section 3.6.1 has been modified as indicated.

DOI-86: The text in Section 3.6.1 has been changed to reference the wilderness areas as including the non-roaded areas above the river shorelines.

DOI-87: The referenced paragraph in Section 3.6.1 has been modified to reflect the global aspects of the designation.

DOI-88: The text has been changed as indicated.

DOI-89: The middle reach of the Elwha River runs from the Elwha dam at River Mile 4.9 to the Glines Canyon dam at River Mile 13.5. Less than one-half of the reach would be within the Olympic National Park. The park boundary is located at approximately River Mile 9.7. The wilderness designation does not include a moderately wide band along the roaded areas of the middle reach. The non-wilderness areas in this reach generally include the river and both banks as shown on a map provided by Paul Crawford of Olympic National Park on January 25, 1990.

DOI-90: Section 3.6.4 has been modified to indicate the recent additions to the Resources Management Plan that specifically address issues related to the Elwha/Glines Canyon Projects.

DOI-91: The initial paragraph of each resource topic in Chapter 3 is intended to summarize the importance of the resource. Therefore, the staff has only added the reviewer's major emphasis to the beginning of Section 3.7.

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DOI-92

Page 3-81., Paragraph 2.:
Replace sentence beginning line 4 with the following: "Frontcountry areas within the ONP such as the Hoh River rain forest, Lake Crescent, Hurricane Ridge, and Lake Quinault receive greater overall use than the Elwha River drainage. However, in 1990, the Elwha Subdistrict received over 8,500 backcountry use nights, representing nearly ten percent of the park's total overnight use."

DOI-93

Page 3-81., Paragraph 4.:
ONP comprises 927,626 acres, not "922,065 acres", and receives approximately 3,500,000 visits, or entries per year (not "visitors").

DOI-94

Page 3-83., Paragraph 6.:
Replace sentence beginning line 7 with the following: "Most of the Elwha River drainage area, except around Lake Mills, the Glines Canyon Project area, and road corridors, are also designated as wilderness under Public Law 100-668 of November 16, 1988."

DOI-95

Change "Backcountry" to "Wilderness" and "1990" to "1991".

DOI-96

Page 3-86., Paragraph 1.:
The primary put-in site for most whitewater trips is at the Altaire Campground, not at the Elwha Campground.

DOI-97

Page 3-86., Paragraph 3.:
Replace sentence 3 and 4 of this paragraph with the following: "Because such a large proportion of the Elwha Subdistrict is designated Wilderness and is managed for dispersed, wilderness recreational opportunities, it generally receives less use than the more heavily developed subdistricts of the park. The Elwha Subdistrict receives 25 percent as many visitors as the neighboring Hurricane Subdistrict and five percent as many as the Lake Crescent Subdistrict; both of these areas have facilities such as major roads, ski development, overnight lodging, or food services that attract heavier visitation."

DOI-98

Page 3-87., Paragraph 3.:
Replace sentence beginning line 7 with the following: "It is only accessible by foot or on horseback on national park trails."

DOI-99

Page 3-87., Paragraph 4.:
Lake Quinault Lodge is not in ONP.

DOI-100

Replace last sentence this paragraph with the following: "One of the predominant views from the Ridge is southwest into the upper Elwha Valley."

DOI-101

Page 3-88., Paragraph 3.:
Replace sentence beginning line 3 with the following: "In 1988, most of ONP including the Elwha River Valley, except the Glines Canyon Project area (including Lake Mills) and the road corridors, became federally designated wilderness."

DOI-102

Replace sentence beginning line 5 with the following: "Unlike Lake Aldwell which is surrounded primarily by private timberlands, Lake Mills is part of a national park, and is a portal to federally designated wilderness, a UNESCO-designated Biosphere Reserve, and a World Heritage Site."

DOI-103

Page 3-90., Paragraph 4.:
This sentence describes the road to the Lake Mills boat launch as a "steep gravel road (which) leads down" to the boat launch. This gives an impression of a remote, almost inaccessible site. The road is actually short, almost level, and is accessible to almost any vehicle.

DOI-104

Page 3-95., Paragraph 5.:
The second sentence of this paragraph is a statement of opinion, ("the weathered concrete blends into the adjacent canyon walls") and should be deleted. Opinions of many visitors to ONP contradict this statement.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-92: As indicated in response DOI-91, the first paragraph of Section 3.7 is intended to summarize importance. While the backcountry use of the Elwha River drainage is important and discussed in this section, 10 percent of use is not a significant amount.

DOI-93: Section 3.7.1 has been modified as indicated.

DOI-94: The referenced sentence in Section 3.7.2 has been modified to better describe the actual extent of non-wilderness in the Elwha Valley.

DOI-95: Section 3.7.2 has been modified as indicated.

DOI-96: Section 3.7.2 has been modified as indicated.

DOI-97: Section 3.7.2 has been modified to reflect the reviewer's comment.

DOI-98: The sentence has been modified.

DOI-99: The sentence has been modified.

DOI-100: The sentence has been modified.

DOI-101: Sentence has been added.

DOI-102: Modification to text has been made.

DOI-103: The reference to steep has been eliminated.

DOI-104: The sentence has been modified to more accurately describe the existing visual condition.

COMMENTS OF DEPARTMENT OF INTERIOR

DOI-105 **Page 3-108., Paragraph 1.:**
Although there was a "pattern" of coastal village habitation, the interior of the Elwha River drainage also included settlements, which were permanent sites for some groups. The best documented settlement is the Indian Creek area.

DOI-106 **Page 3-108., Paragraph 3.:**
This sentence refers to a "first road" in the 1860's which connected Port Angeles with Grays Harbor and Dungeness. It is not likely that there was anything approximating a "road" between Grays Harbor and Port Angeles, at least not south of Forks, until the 20th century, probably not until the Olympic loop highway (S. Schultz, Historian, ONP, Port Angeles, Washington, March 1991).

DOI-107 **Page 3-108., Paragraph 4.:**
The Humes brothers and Herrick settled in the Elwha Valley in the 1890's (S. Schultz, Historian, ONP, Port Angeles, Washington, March 1991).

DOI-108 **Page 3-109., Paragraph 3.:**
Klallam territory stretched from the Hoko River to Royal, to the south point of Beaver Lake, to the Peak of Mt. Olympus, to the peak of Mt. Anderson, to the north point of Quilcene Bay (Indian Claims Commission, Findings of Fact, Docket No. 134, December 2, 1957). In other words, the Klallam territory included the interior and reached the Hoko and Hood Canal.

DOI-109 **Page 3-109., Paragraphs 4 & 5.:**
Klallam villages were known at many more locations than those listed in these two paragraphs. In her 1927 monograph, Klallam Ethnography, University of Washington, Dr. E. Gunther reported that she was informed that a large village site existed at the junction of Cat Creek and the Elwha River. Randall Schalk reports in his 1988 Research Design for the park that he regarded Gunthers's statement as being correct but postulates that more than one village existed along the river and has determined through his research that as many as twelve villages existed along the river prior to contact with euro/americans in the early part of the nineteenth century.

DOI-110 **Page 3-110., Paragraph 2.:**
Replace "Skykomish" with "Skokomish".

DOI-111 **Page 3-110., Paragraph 4.:**
The survey mentioned in this paragraph is an inadequate basis for a determination of the presence or absence of archeological sites beneath Lakes Aldwell and Mills, and a statement to this effect should be included in the FEIS. At least one cabin of an early settler to the valley is beneath the waters of Lake Mills (documented in the letters of Grant Humes, April 19, 1927) and other native settlements are likely. It should be noted that a more thorough survey of the lakes during drawdown could likely reveal cultural sites.

DOI-112 **Page 3-110., Paragraph 5.:**
(Also, see section 4.0 references to National Register listing of these projects). Both powerplants have been listed (December, 1988) on the National Register of Historic Places. We agree with conclusions in the DEIS that each of the four alternatives would impact these National Register properties. Construction of fish passage facilities at either or both dams would have an adverse impact on the historical character of the projects, and removal of one or both of the projects would have significantly larger effects on these National Register properties. However, descriptions of these effects in the DEIS are misleading without an explanation that the National Historic Preservation Act does not preclude removal of registered properties after proper documentation. This should be explained in each section of the FEIS which discusses these impacts.

The discussion of the inclusion on the National Register should note the full conditions of the listing as described in the Elwha Project nomination. The statement of significance in the Elwha Project National Register nomination lends

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-105: The DEIS states (Section 3.10.1): "Klallam villages were known, ethnohistorically, to be located on Ediz Hook, near the Elwha mouth, and near the mouth of Indian Creek, where the Lake Aldwell delta is now located." This is not meant to be an exhaustive list of known or probable prehistoric or protohistoric Klallam settlements. Such a list would be beyond the EIS's scope. Ethnographic sources state that the Klallam culture was oriented towards the coast and coastal resources, but that the resources of the interior, particularly those along the major rivers such as the Elwha, were important also (Suttles, 1990).

DOI-106: The source for this information is Jarvis Russell's (1971) history of Clallam County.

DOI-107: The text has been changed in Section 3.10.1.

DOI-108: Most ethnographic sources (for example, Suttles, 1990) list Klallam aboriginal territorial boundaries as extending from Port Discovery Bay to Clallam Bay. These sources do not generally include Hood Canal in Klallam territory.

DOI-109: See response DOI-105.

DOI-110: The text has been changed in Section 3.10.1.

DOI-111: Applicants for license renewal are not required to draw the reservoir down to search for archaeological sites covered under a license granted prior to the National Historic Preservation Act. The former lakebed would be covered, in any case, in 1 or 2 or more feet of silt during drawdown so that archaeological sites would not be visible. The exception to this would be the that original ground surface and archaeological sites could be visible due to shoreline erosion at Lake Mills since the lake would be partially drawn down and then held at an elevation of approximately 490 feet for 9 months under alternatives that include Glines Canyon dam removal The DEIS text has been changed, therefore, to state that drawdown should be monitored by a professional archaeologist.

DOI-112: Documentation is a mitigation measure. The DEIS explains this in its appropriate place in Sections 4.1.9.3, 4.2.9.3, 4.3.9.3, and 4.4.9.3 as a "Staff-Recommended Measure," rather than in the Affected Environment section as the comment implies it should have. The DEIS is thus not misleading in this regard.

COMMENTS OF DEPARTMENT OF INTERIOR

DOI-112 cont'd

perspective to the late twentieth-century valuation of the historical significance of these projects:

> "Although construction of the facility represented a significant achievement for the utility, the project provided no mitigation for the serious loss of fish runs, the inundation of wildlife habitat, or the disruption to the tradition(al) cultural and subsistence economy of the Lower Elwha and Jamestown tribes. Any assessment of the historical impact of this plant must recognize the damage inflicted on both the native inhabitants and the natural environment."

DOI-113

Page 3-110., Paragraph 6.:
This paragraph states, "No Native American heritage sites..." (in other words, "Traditional Cultural Property/(ies)") "...have conclusively been identified in the project Area of Potential Effects." However, the FEIS should note that the entire Elwha River drainage could be considered a Traditional Cultural Property. Although much attention is given to consideration of the historic salmon runs as a natural resource, the Klallam tribe regards the salmon and their habitat as cultural resources. The National Register Guidelines for Evaluating and Documenting Traditional Cultural Properties (Bulletin no. 38) states that examples of properties possessing traditional cultural significance include locations "where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historical identity."

The importance of the Elwha River system to the economic and spiritual pursuits of the Klallam, such as creation stories associated with landmarks in the vicinity, possible spirit quest sites, cleansing areas, and traditional food resource areas, may warrant its documentation as a Traditional Cultural Property. Ethnographic studies initiated by ONP are assessing the significance of the Elwha River drainage, among other traditional use areas, for consideration as Traditional Cultural Properties, and this should be noted in the FEIS.

DOI-114

Page 3-112., Paragraphs 2, 3 & 4.:
Relatively high levels of sulfur dioxide have been measured in ONP near the Visitor Center in Port Angeles. Additionally, Port Angeles was at one time a non-attainment area for sulfur dioxide. High levels of ozone have been measured in Mount Rainier National Park, and we understand that the counties of King, Pierce and Snohomish will be declared non-attainment for ozone. Therefore, the characterization of the Pacific Northwest as having only a few air quality problems in the urban areas and dust in the rural areas is not accurate.

Though acid rain measurements have not indicated "...that acute impacts are occurring," highly acidic fog has been measured at several places in the northwest. (Basabe, Felix A., R.L. Edmonds, W.L. Chang and T.V. Larson Fog and Cloudwater Chemistry in Western Washington. In Transactions Effects of Air Pollution on Western Forests. AWMA. Anaheim, California, June 1989, pp 33-39)

DOI-115

Page 4-1.:
We concur with the FERC staff's approach to determining fish restoration feasibility based on 1) passage, 2) harvest, 3) habitat, and 4) availability of a native stock. However, given the goal of reestablishing wild, self-sustaining anadromous fish populations, access to high quality habitat is especially critical to successful restoration. Even if fish passage measures were highly successful, great expense and effort would be wasted for the lack of suitable spawning or rearing habitat.

Fish passage is a very critical variable and we remain concerned with the many uncertainties involved in each of the juvenile and adult passage scenarios. Our concerns are based on results of studies conducted on the Elwha River since 1954, as well as the poor record of fish restoration above many other dams in the Pacific Northwest. In many of these cases, self-sustaining wild runs which provide fishery and ecosystem benefits have not resulted. Harvest management is

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DOI-113: National Register guidelines for evaluating and documenting traditional cultural properties (National Park Service, n.d.) state that the traditional uses of a property must be carefully considered in defining property boundaries. Otherwise, any aboriginal group could, with justification, claim that its entire aboriginal territory is a traditional cultural property eligible for nomination to the National Register of Historic Places and subject to restricted use on federal lands or for federally permitted undertakings, since its members lived and subsisted there. Subsistence activities in themselves, even if imbued with special ceremonial or religious significance, do not qualify a property for listing on the National Register. Similarly, age in itself does not qualify historic or archaeological sites for National Register listing. Otherwise, large portions of our towns and cities that are greater than 50 years old would qualify for National Register status. Instead, for historic sites as well as traditional cultural properties, eligibility for National Register listing is based on clearly defined characteristics of carefully defined sites or districts. The entire Elwha system does not qualify as a traditional cultural property in this regard.

DOI-114: The staff believes the helpful information provided in this comment is consistent with the EIS statement that acid rain, the greenhouse effect, and ozone levels are emerging air quality issues.

DOI-115: Comment noted.

DOI-115 cont'd

also important, but mechanisms to deal with overharvest are available. The lack of a native broodstock would not necessarily preclude restoration.

The record of anadromous fish introductions in Washington is encouraging. Non-native sockeye have been introduced into Lake Washington, chinook and coho into the Deschutes River, and spring chinook into the upper Wind River. Although every effort should be made to utilize native Elwha River stocks, other populations with similar genetic and biological characteristics are probably available in nearby watersheds. An exception may be sockeye, for which there are few donor stocks available in the region.

DOI-116

Page 4-1., Paragraph 3.:
We concur that the middle and much of the lower reach of the Elwha River would continue to be sediment starved. However, we disagree that these areas would maintain their current level of armoring. Rather, we expect armoring conditions to worsen as the smaller sized bed elements are flushed from the channel during periods of high flow.

DOI-117

Page 4-2., Paragraph 5.:
The statement that the "...downstream substrate is probably as coarse as it can get given the grain size of materials that are available..." is not supported by statements found on page 4-78, indicating that channel armoring is disrupted by flows in excess of 9,000 cfs, and that flows of this magnitude occur about every year. This issue is significant because further coarsening of the channel bed in the lower and middle river would result in even poorer spawning conditions, and further increase the uncertainty of the restoration prospects under the applicant's proposal.

DOI-118

Page 4-2., Paragraph 6.:
The revised estimates of the Elwha River's former and present contribution of sediment (150,000 and 2,400 cubic yards, respectively) to the Elwha Delta and coastal zone are more reasonable than the previous estimates which attributed most of the near-shore contribution to the eroding coastal bluffs. As a consequence, the hydroelectric projects should be held responsible for a larger share of the costs of protecting Ediz Hook.

DOI-119

Page 4-3., Paragraph 2.:
The FWS should be included in the list of agencies with whom the applicant must consult with in the development of its erosion and sediment control plan.

DOI-120

Page 4-4., Paragraph 3.:
We are opposed to the applicant's proposal to use storage in Lake Mills to optimize power production. Drafting the reservoir would result in: (1) the loss of aquatic production in the shallow littoral zone of the reservoir; (2) increased turbidity that would result in the reservoir and the middle reach (see comments for page 4-9); (3) the potential for more frequent ramping events; and (4) the reduction in magnitude and frequency of freshet events which could delay migration. Additionally, a drawdown of 10 feet would leave less than 4,000 acre-feet of water in reserve for instream flows via the spillway gates in the event of project shutdown. For perspective, in the event of project shutdown, this quantity is sufficient to maintain a flow of 200 cfs for only 10 days.

DOI-121

Page 4-5., Paragraph 1.:
Flow augmentation, as proposed by the applicant, is of questionable benefit. The applicant's flow augmentation proposal could result in a dampening of freshets in the fall during reservoir refilling. These freshets are important in triggering upstream movement and spawning by chinook salmon. Without these freshets, there could be a delay in spawning. Timing of spawning is important in synchronizing intergravel egg development, fry emergence, food availability and smolt formation.

While the concept is appealing, upon further examination it is clear that significant biological tradeoffs would be required to implement flow augmentation. We do not support the drafting of Lake Mills (see page 4-4).

DOI-116: Bedload transport of material ranging from gravel to boulders only occurs during floods. The transport rate is a function of the magnitude and duration of the flood flow. Even though the gravel could be transported downstream much faster than the boulders, they probably are not, because they are thrown to the edges of the channel and are trapped among the lower velocity areas of the cobble and boulder-bed elements. It is estimated that the bed would be composed of all boulders and cobbles after about 77 years without sediment, if there were not some limited source of gravel to the middle and lower reaches. Relatively small amounts of sediment are supplied to the middle reach and upper portion of the lower reach by the reworking of the extensive alluvial terraces along the river during flood flows.

DOI-117: See response DOI-116.

DOI-118: The staff estimate of the sediment supply rate of sand to boulder-sized material to the mouth of the Elwha River is significantly higher than all previous estimates. The question is, however, what portion of that material is available to the nearshore area rather than being washed into deeper waters. The staff's estimate of material available to the nearshore zone was based on Corps methods referenced in the DEIS. No attempt was made by the staff to fully evaluate the magnitude of coastal sediment transport. The estimated transport values in the FEIS have been changed to reflect the uncertainty of the relatively old coastal transport estimates from the Corps. See response JR-52.

DOI-119: The text has been changed in Section 4.1.1.3 to add FWS to the review of the Erosion and Sediment Control Plan.

DOI-120: Comment noted.

DOI-121: Comment noted; also see response NMF-32. The use of the reservoir for late summer releases can be decided by the agencies; however, the final decision on their use can be decided among all management groups. If no consensus is reached, the Commission will decide. Mandating use of groundwater supplies for commercial and industrial use is under the direction of agencies other than the FERC.

DOI-121 cont'd

Moreover, the limited storage available for flow augmentation is unlikely to provide significant improvements to downstream habitat. While the DEIS indicates that flow augmentation would be " ... provided upon request by State agencies and tribes", it is unclear whether the resource agencies would have any say in the decision to reserve this water for the purpose of flow augmentation.

There is also little assurance that the storage in the upper 10 feet of the reservoir would be available for flow augmentation because of the competing use for optimizing power production. In addition, reservoir drawdown could have a significant impact on outmigrating fish if it encourages a higher proportion of the migrating fish to enter the unscreened turbine intake by drawing the warmer surface waters (thermal stratification) closer to the spillway gate opening. Under this scenario, fish occupying the deeper and cooler water would be that much closer to the turbine intake and would be subjected to an even greater disparity between turbine intake and spillway flows. Consequently, the entrainment of migrants could be increased by flow augmentation. Outmigrant studies (8) indicated that significant numbers of juvenile chinook salmon would migrate past the Glines Canyon Project during late summer.

We do not support the use of Lake Mills storage as a temporary or permanent solution to the lack of a minimum instream flow because it merely shifts the problem to another natural resource base. Rather, groundwater supplies should be developed for municipal and domestic use during periods of low river flow.

DOI-122

Page 4-6 to 4-10.:
The applicant's proposed spill program discussed on these pages does not take into consideration the resulting diurnal changes in temperature and dissolved oxygen. The impact such changes would have upon aquatic resources needs to be described.

DOI-123

Page 4-7., Paragraph 1.:
Because of uncertainty regarding the proposed 100 cfs spill level and its ability to attract and safely pass juvenile salmonids, the FEIS should also model the temperature affects of higher spills at the Glines Canyon Project. Spills in the range of 130 to at least 175 cfs should be modelled.

Table 4-1 indicates a 2.2°C net temperature increase of the Glines Canyon Dam outlet water temperatures under 200 cfs inflow for August 19, 1987, conditions. Yet, page 4-7, paragraph 1, line 9 states that temperatures under this regime would increase by 1.2°C. Similarly, other net temperature increases mentioned in this paragraph don't agree with Table 4-1. Text and tables need to be consistent.

The FEIS should address downstream temperature increases resulting from spills greater than 100 cfs at Glines Canyon Dam, because higher spills may be needed to safely and effectively pass migrants (see page 2-13 comments). Throughout the 1989-90 juvenile chinook passage monitoring at Glines Canyon (8), a 175-cfs minimum spill (0.4-foot opening of the Glines spillgate) was used for passage evaluations. A 175-cfs minimum spill (0.4-foot gate opening) should also be temperature-modelled and the results described in this section.

DOI-124

Page 4-10., Paragraph 5.:
It is difficult to comment on the effects of lowering the Elwha Dam headgates on temperature without having reviewed a more complete description of the applicant's proposal. This information should be provided.

DOI-125

Page 4-11., Paragraph 3.:
We concur with the "poor" restoration outlook given for spring chinook, pink, chum, and sockeye salmon, and sea-run cutthroat and Dolly Varden trout under the applicant's proposal, but disagrees with the "fair" rating for restoring wild, self-sustaining runs of fall chinook salmon. This rating is overly optimistic because of the uncertainties associated with reservoir, spillway, and Eicher screen passage, and the continued degradation of habitat in the middle and lower river. The restoration outlook for winter- run steelhead has been rated both

DOI-122: Because Lake Mills and Lake Aldwell are eutrophic, diel (24-hour) fluctuations in dissolved oxygen are expected to be minimal. Consequently, effects of the applicant's proposed spill on dissolved oxygen concentrations would be relatively constant throughout the day and night. The effect of proposed nightly spills on water temperature have been explained in more detail in Section 4.1.2.2.

DOI-123: Section 4.1.2.3 provides a description of the applicants' proposal with staff-recommended measures. One of these measures is a 200-cfs spill from Glines Canyon dam during the night for fish passage. Changes in temperature predicted under this 200-cfs spill are described in the FEIS. The DEIS text is correct in stating an increase of 1.2°C under a 100-cfs spill for August 19, 1987 conditions. Values provided in Table 4-7 are incorrect because they portray temperature changes occurring under a 450-cfs spill. This mistake has been corrected in Section 4.1.2.2.

DOI-124: Comment noted.

DOI-125: The staff has changed the rating. Based on the criteria, which the staff believes is reasonable, the ratings stand with some modifications. See Section 4.1.3.2. The staff does not believe this statement is needed in the summary.

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DOI-125 cont'd

"fair" and "good" in this section. The latter rating is overly optimistic in view of the anticipated mortality of steelhead kelts from passing beneath a 3-inch opening at velocities in excess of 20 feet per second.

This summary should also state that the continued interception of spawning gravel and woody debris would result in the further decline in habitat quality for all species using the lower river.

DOI-126

Page 4-12., Paragraph 4.:
See page 4-11 comments regarding restoration prospects for winter-run steelhead.

DOI-127

Page 4-13.:
The figures in Table 4-3 should be considered to be minimum estimates of available habitat for coho salmon and steelhead trout because the survey on which these estimates were based was conducted during the critically dry period. If the survey was conducted during a year of normal precipitation or at a time other than the late summer low flow period, additional habitat (e.g. tributaries and stream segments) would likely have been identified. This conclusion is supported by the applicant's survey report which noted that many tributaries were dry at the time the survey was conducted.

DOI-128

Page 4-14.:
The FWS concurs with the overall restoration outlook presented in Table 4-4, except for the evaluation of fall chinook salmon and winter-run steelhead trout which appear overly optimistic. See comments for page 4-11.

DOI-129

Page 4-15., Paragraph 4.:
We concur that stocks from other rivers would be used only if native or existing non-native stocks were not available.

DOI-130

Page 4-15, Methods.:
The NPS generally concurs with the FERC staff's methodology for determining fish restoration prospects using passage, fishery harvest, habitat, and availability of broodstock. Our concerns are with particular estimates or assumptions used in assessing these prospects.

DOI-131

Page 4-16.:
In Table 4-5, reference to "screen survival" should be deleted in the description of downstream survival factors at Glines Canyon Dam because screening of this intake was not used in any assessment in the DEIS.

DOI-132

Page 4-17., Paragraph 1.:
The method used for evaluating the potential for restoring wild stocks is a reasonable approach.

DOI-133

Page 4-17., Paragraph 2.:
A "poor" rather than "fair" restoration potential rating is appropriate for fall chinook due to likely passage mortality problems not addressed in the DEIS. We note that under the staff's rating system, a "fair" rating was just minimally achieved because of passage losses of 46 percent. Greater than 50 percent passage losses in the staff's rating system, would have yielded an overall poor rating similar to the Joint Fish and Wildlife Agencies' assessment (which is poor/unknown) for fall chinook restoration potential. We believe that at least an additional 5 percent passage mortality loss is highly probable in the fall chinook passage model in Appendix B.

DOI-134

Page 4-17., Paragraph 3.:
While we concur with the staff's assessment methodology regarding restoration prospects, we do not agree with the fair rating assigned to fall chinook under the applicant's proposal. Our concerns relate primarily to passage prospects and degraded habitat conditions from the head of Lake Mills downstream (comments regarding habitat conditions are discussed relative to p4-19 P2. L1.). The staff determined that passage mortality for this stock would be approximately 46 percent resulting in a marginally favorable rating (50 percent is the cutoff

DOI-126: The text has been changed in Section 4.1.3.2.

DOI-127: The text has been changed in Section 4.1.3.2.

DOI-128: The staff believes the assessment is accurate and will not change it.

DOI-129: Comment noted.

DOI-130: Comment noted.

DOI-131: Table 4-7 has been changed.

DOI-132: Comment noted.

DOI-133: The staff does not concur.

DOI-134: The staff has adjusted some survival factors. See Appendix B and responses to this section.

DOI-134 cont'd
between marginally favorable and unfavorable). However, natural mortality estimates used in this estimate were taken from an Idaho stream which may not be applicable to the Elwha River, predation will probably be greater than anticipated, natural outmigrant timing is probably earlier than assumed (see comments regarding pB-3 to B-4), and there is high uncertainty regarding survival under the proposed 100 cfs spill regime (see comments regarding p2-13. P4. L2.). It appears that any one or a combination of these factors would result in a small increase in reservoir mortality which would push the passage rating of this stock into the unfavorable category. We suspect that passage conditions for this species are unfavorable which results in a poor overall rating similar to the JFWA assessment of restoration prospects.

DOI-135
Page 4-18., Paragraph 3.:
The criteria for favorable and unfavorable passage ratings for the chinook and steelhead are different. The FEIS should document why a 46 percent passage loss for chinook is considered marginally favorable (which ultimately results in a "fair" rather than "poor" assessment for this species), whereas passage mortality of this magnitude for steelhead (page 4-25) is considered unfavorable.

DOI-136
Page 4-19., Paragraph 2.:
The Department of the Interior was a party to the JFWA conclusion that spawning habitat in the lower river is not adequate for chinook (see comments relative to page 3-33). Due to the lack of gravel recruitment and inundation of mainstem habitat, approximately 16 miles of summer/fall chinook spawning area has been, and would remain severely degraded under the applicant's proposal. We do not disagree with the FERC staff's rating of "marginal" for the overall chinook habitat; however, the continued degradation of the lower 16 river miles will substantially reduce ecosystem and fishery benefits for this stock. Regarding spring chinook, we believe the upper river, where these fish would return, will provide excellent habitat. Therefore, the upper reach should be rated as "favorable" rather than "adequate".

We do not agree that spawning gravel in the lower river is adequate for chinook salmon. It appears that the DEIS' argument for adequate spawning gravel is based solely on the high spawner density observed in recent years, even though no evaluation of effectiveness has been made. It is probable that many of the in-river spawners are hatchery strays.

DOI-137
Page 4-20., Paragraph 2.:
The FWS concurs that rearing habitat in the lower and middle river have been impacted by the reduction of nutrients, mainly from the interception and trapping of particulate organic material by Lake Mills. This issue needs to be addressed in greater detail in conjunction with the loss of salmon carcasses.

DOI-138
Page 4-20., Paragraph 4.:
We concur that Dolly Varden predation on chinook fry is likely to be a problem in the project reservoirs, and is a major uncertainty in the restoration outlook for chinook salmon under the applicant's proposal.

DOI-139
Page 4-21., Paragraph 2.:
We disagree with the statement that few chinook sub-yearlings would be present in the lower river in late summer, so *Dermocystidium* would not be a potential problem. Juvenile chinook monitoring (8) clearly showed that late summer was the peak of outmigration at Glines Canyon Dam, so a relatively high density of juvenile chinook is likely below the dams in late summer. If a high density of juvenile chinook below the Elwha dams in late summer is related to outbreaks of *Dermocystidium*, then excessive juvenile chinook mortality may occur.

DOI-140
Page 4-22., Paragraph 1.:
While the Eicher screen tests indicate promising passage results for coho salmon, it should be noted that seawater challenge tests, as requested by the Joint Fish and Wildlife Agencies, have not been conducted. An evaluation of passage survival based solely on an assessment of scale loss and other signs of visible injury may not reveal internal injuries or stress which could reduce the ability

DOI-135: The reason for the different rating categories is because of the difference in the potential production of the stocks. Steelhead stocks are less productive than coho or chinook. The recruits per spawner are generally much lower for steelhead stocks; thus, they cannot handle as much mortality and still produce viable stocks. Therefore, the staff used a lower acceptable mortality for smolts in the rating system.

DOI-136: See response DOI-60. The text has been changed in Section 4.1.3.2 for chinook. The staff believes this assessment is appropriate.

DOI-137: The staff does not believe further discussion of these factors will substantially enhance the overall evaluation of the impacts to restoration of anadromous stocks.

DOI-138: Comment noted.

DOI-139: The text has been changed in Section 4.1.3.2 for chinook.

DOI-140: See Appendix B changes and responses to this section. The concern for additional mortalities above the mortalities measured by Eicher screen tests has not been indicated in past long-term tests in the system. Tests conducted by Wunderlich and Dilley (1985) and Wunderlich (1988) showed no significant differences between the coho that passed over the dams without screens (even though they had greater scale loss) and the coho released below the dams. It is probable that injury would be higher for the coho stocks going over the dams without protection than those passing through systems designed for protection.

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DOI-140 cont'd — of these fish to avoid predators or adjust to higher salinity of saltwater (osmoregulation) only 5 miles downstream.

DOI-141 — Page 4-23., Paragraph 2.:
In addition to the factors listed in this sentence regarding degraded rearing habitat, the lack of LOD, most of which is trapped in the reservoirs or flushed downstream in an unnatural pattern, further impairs coho rearing habitat in the middle and lower river (see comments p3-46).

DOI-142 — Page 4-24., Passage.:
Consideration should be given to the downstream passage of steelhead kelts in the assessment of passage success. Repeat spawners are a valuable component of wild populations, and provisions should be made in each of the passage alternatives to pass these fish safely downstream. We are particularly concerned with passage of kelts over Glines Canyon Dam if the applicant's proposal were to be adopted. During periods of low flow in June and July when only 100 cfs would be spilled, the spill gates would only be open approximately 2.5 inches. This is not adequate to pass adult steelhead. We are also concerned about the prospects of kelts passing through an Eicher screen.

DOI-143 — Page 4-24., Paragraph 5.:
Because of the problems with getting steelhead kelts safely past the projects (see comments for page 4-11) and the continued degradation of habitat in the lower and middle river, the restoration outlook for winter-run steelhead trout seems overly optimistic.

DOI-144 — Page 4-25.:
The estimates of passage mortality, as presented in Table 4-9, appear reasonable even though supporting data are lacking.

DOI-145 — Page 4-27., Paragraph 2.:
Although genetically pure native winter steelhead likely do not remain in the lower river, landlocked remnants may be present in the upper river. Reisenbechler and Phelps (1985) examined the genetic structure of rainbow trout captured above Lake Mills, and concluded that these fish were more closely related to local wild steelhead trout than to hatchery trout. The use of these stocks may be possible to restore the winter steelhead runs to the middle and upper river.

DOI-146 — Page 4-27., Paragraph 4.:
The Department of the Interior was a party to the conclusion that the prospects for pink (and chum) passage through Lake Aldwell and Elwha Dam are unfavorable, if not impossible. A literature review and consultation with fishery biologists in Washington, British Columbia, and Alaska (JFWA, 1990) revealed no substantial evidence of these species migrating above lakes or reservoirs. ONP biologists expect that in addition to these problems, relatively high mortality of juvenile pink and chum would result as these species pass through the proposed Eicher screen.

We concur that the restoration potential for pink salmon is poor. However, the absence of any measures in the applicant's mitigation proposal to improve conditions in the lower river for pink salmon, (e.g. gravel augmentation) is unacceptable. The feasibility of improving habitat for pink salmon in the lower river needs to be addressed and discussed in the FEIS. In the absence of efforts to improve habitat in the lower river, it is likely that the Elwha River pink salmon run will continue to decline.

DOI-147 — Page 4-27., Paragraph 5.:
Although not numerous, there are examples where successful production of pink salmon fry is believed to occur above small natural lakes (Carl Hoffmeister, Alaska Department of Fish and Game, personal communication). In these cases, the lakes are typically much smaller than the Elwha River reservoirs, and are generally within a mile of marine waters. Because of these differences and the assumption that these Alaskan pink salmon stocks have adapted to the conditions

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DOI-141: The text has been changed in Section 4.1.3.2.

DOI-142: The text has been changed in Section 4.1.3.2. The staff does not perceive that kelts passing the Eicher screens will be a problem because they are designed to protect juveniles. The opening is large enough for these fish and velocity is relatively low.

DOI-143: The staff believes the rating is valid.

DOI-144: Comment noted.

DOI-145: Comment noted.

DOI-146: See Section 4.1.3.3. Generally, the pink and chum stocks are not using the available gravel in the lower reach, so additional gravel will not change the restoration outlook or increase run size.

DOI-147: In the staff's view, efforts at restoring runs above the dams have such low prospects of success that gains in run sizes would not justify the cost.

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DOI-147 cont'd

of their natal environment, we are not optimistic that the use of a donor stock so far removed from the Elwha River would be successful. However, such an option should not be ruled out completely, if the only other choice is the Elwha River without pink salmon. The applicant should be responsible for funding this program, if needed, because of the impacts caused by the hydroelectric projects.

DOI-148

Page 4-28., Paragraph 2.:
The Eicher screen was not designed to safely pass pink salmon fry. The Eicher screen has not been evaluated for juvenile fish less than 100 mm. in length, even though the Joint Fish and Wildlife Agencies have repeatedly made that request. The proposed Eicher screens at the Elwha Project should be redesigned to safely pass all sizes of juvenile salmonids, even pink and chum salmon fry, so that future restoration options are not precluded.

DOI-149

Page 4-28., Paragraph 5.:
We do not concur that "the habitat above Glines Canyon Dam is not suitable for pink salmon" (see comments for page 3-39). We agree that most of the middle reach is not suitable for pink salmon spawning, and for this reason, gravel augmentation should be included as part of the applicant's mitigation plan and responsibility.

DOI-150

Page 4-29., Paragraph 3.:
There are no measures for chum salmon in the applicant's mitigation plan. This is unacceptable. Gravel and large woody debris augmentation should be included in the mitigation plan to address some of the obstacles to restoration noted in the DEIS. Comments presented for pink salmon regarding screening and habitat in the middle and upper reaches also apply to chum salmon (see comments for pages 3-39, 3-41, 4-27, and 4-28).

DOI-151

Page 4-30., Paragraph 2.:
This sentence states that "habitat for chum salmon under the applicant's proposal is judged to be marginally favorable". We question this judgment, and find it to be inconsistent with statements regarding unsuitable chum habitat in the middle and lower river, and irreconcilable with "unfavorable" ratings ascribed to pink habitat (p3-39 to p3-41). Spawning areas in the mainstem of the middle river are not suitable for pink or chum, and are less than optimum for chum spawning in the lower river. These conditions do not constitute "marginally favorable" habitat.

DOI-152

Page 4-30., Paragraph 5.:
Regarding losses of sockeye passing through an Eicher screen, we believe the text should read "...slightly lower than that of coho or winter steelhead", instead of "slightly higher."

DOI-153

Page 4-30., Allowable Harvest Rate.:
Harvest rates on a restored sockeye stock would depend upon the timing of the run. An early run (eg. Lake Washington stock) would have a lower rate than a later-timed run, since it would migrate through the Strait before the beginning of the large fishery for Fraser River sockeye.

DOI-154

Page 4-31., Paragraph 2.:
The kokanee in Lake Sutherland may contain the genetic makeup of the former Elwha River sockeye. If this is the case, they would be the preferred stock for restoring sockeye salmon runs. Lake spawning stocks also occur in Lake Washington along the eastern shoreline.

DOI-155

Page 4-32., Paragraph 3.:
What evidence supports the contention made in this sentence that Dolly Varden would spawn primarily in tributaries instead of the mainstem?

DOI-156

Page 4-34 to 4-36.:
We agree that the FERC staff-recommended measures are needed should the applicant's proposal be authorized. These measures include: (1) refinement of the Elwha Project fish ladder design; (2) a contingency plan calling for the

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DOI-148: Based on the conclusion that few fish would survive reservoir passage, testing and altering Eicher screens to successfully pass pink or chum salmon would not be cost effective because they would have no significant effect on restoring runs to this reach.

DOI-149: Because of insufficient passage survival, gravel augmentation to this reach would not increase or restore runs to the middle reach (see Section 4.1.3.3).

DOI-150: See Section 4.3.1.1.

DOI-151: The text has been changed in Section 4.1.3.2.

DOI-152: The text has been changed in Section 4.1.3.2.

DOI-153: Comment noted.

DOI-154: Whether an existing lake kokanee stock is preferred over sockeye stock is unknown The kokanee have established a preference for not outmigrating, so their use may not be preferred. For example, the majority of the Lake Washington run was believed to start from fry and fingerling plants from Baker Lake sockeye stocks although some beach spawning stocks appear to be of a different origin (Withler, 1982). Before these plantings, the system was not totally cut off from the marine environment and did contain kokanee. This confuses the issue of which stock would be better. Withler (1982) also noted systems with kokanee and unobstructed marine access do not necessarily produce sockeye. Although Withler (1982) noted success at establishing sockeye runs in lake systems that did not have unobstructed access to the marine environment, he also cites attempts to establish runs in a British Columbia lake system that failed.

One of the conclusions of Withler's report about transplanting of Pacific salmon was that even with adequate access between marine and freshwater systems, if a specific stock (e.g., spring chinook) was not already in the system, transplants of this stock would have little success establishing future runs. Considering that it is doubtful that sockeye historically used this system, attempting to establish sockeye in the future also appears unlikely, no matter which stock is used.

DOI-155: The text has been changed in Section 4.1.3.2.

DOI-156: The text has been changed in Section 4.1.3.3.

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DOI-156 cont'd

installation of conventional screens if the Eicher screens are ineffective; (3) operation of the Glines Canyon Project in a true run-of-the-river mode; (4) fish passage monitoring; (5) trap and haul consultation with the Joint Fish and Wildlife Agencies (design and operation); (6) funding of the both McDonald stream gages until an adequate correlation has been established; and (7) an indefinite commitment for funding the anadromous fish outplanting program, instead of the 10-year period being proposed by the applicant.

In addition, there are other measures that are needed including: (1) spawning gravel and large woody debris augmentation in the lower and middle reaches; (2) an expanded anadromous fish restoration plan that includes the six anadromous fish stocks (pink, chum, sockeye, and spring chinook salmon, Dolly Varden char, and sea-run cutthroat trout) ignored in the applicant's mitigation plan; and (3) screening the Glines Canyon turbine intake.

DOI-157

Page 4-36.:
While we concur that the FERC staff recommended studies should be conducted, we are concerned that the results probably will not be available until after licensing. In some cases, solutions to passage problems such as reservoir mortality may not be readily available. Study results which indicate higher than expected mortality and reduced prospects for restoration would not be available to FERC in their decision as to whether or not the projects should be licensed.

DOI-158

Page 4-36., Paragraph 2.:
High passage survival has been achieved at the Glines Canyon Dam spillway with spills of 450 cfs; variable results were achieved at 100 cfs. Therefore, we believe a minimum spill of 450 cfs should be required until studies described on this page are completed.

DOI-159

Page 4-37., Paragraph 4.:
We do not consider the estimated 6 percent mortality of salmonids passing the Glines Canyon Project to be insignificant, especially when combined with other sources of passage mortality and the FERC staff's assessment of fair and poor restoration prospects for fall and spring chinook, respectively. We believe screening of Glines Canyon Dam is critical to passage success under any scenario in which this dam is retained. The FEIS should also discuss the possibility of the provision of Eicher screens at the Glines Canyon Project. A decision regarding installation of screens at the Glines Canyon Project should not be based solely on the potential costs; mitigation is the responsibility of the applicant in utilizing a public resource.

DOI-160

Page 4-41., Paragraph 1.:
While the applicant's mitigation plan may be an improvement over existing conditions, the level of mitigation is inadequate. To put this in perspective, 685 acres of wildlife habitat were inundated, while another 75 acres were impacted by the construction of project facilities (e.g. roads, penstocks, transmission lines). Yet, the wildlife mitigation land base totals only slightly more than 900 acres, and the mitigation plan is generally lacking in actual habitat enhancement measures. On nearly 710 acres, the "mitigation plan" simply calls for not harvesting second growth timber lands. Mitigation on the next largest block of land (147 acres) only involves selective thinning. Besides the limited mitigation land base, the applicant's wildlife mitigation plan calls for "one time" implementation, occurring within the first year following project licensing, with nothing scheduled thereafter. In view of the continuing wildlife impacts caused by the two projects, the applicant's mitigation plan needs to be increased in scope, and include additional mitigation lands, substantive habitat improvement measures, and ongoing implementation of these measures throughout the license period.

DOI-161

Page 4-42., Paragraph 3.:
The assumption that nearly all of the timber land owned by James River would be harvested within 5 years is questionable. The benefits of the applicant's mitigation plan appear to have been artificially enhanced by assuming worst case

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DOI-157: The staff believes based on current information that major problems beyond those already included in the assessment are likely to occur.

DOI-158: The staff has modified the spill to 200 cfs with options for testing and altering spill regime.

DOI-159: See Section 4.1.3.3. The installation of any screening facility has risks. As stated in Section 4.1.3.3, the differences between the current characteristics of a tested facility and that of Glines Canyon indicate that the installation outcome is less clear. The combination of factors (certainty of success, cost, and relative proportion of run) weighed against recommending Eicher screen installation at this site.

While initial assessment of Eicher screens did not indicate that it is impossible, it has several complications that do not occur at Elwha dam, adding to the risk of failing. First, the reasonable location for the screen would be in the penstock near the powerhouse. This would remove fish affected under pressure. To ensure no adverse pressure effects, fish would have to be carried by pipe to near the reservoir water surface to remove the pressure. From here, fish would either have to be discharged into the pool or conveyed in an open channel to below the project. Additionally, the penstock is large (11.7 feet) and the velocity is higher (approximately 10 feet per second) than at the Elwha Project. All of these differences increase the chance for greater injury and death compared to the Elwha Project.

The more elaborate construction would add to the cost of the projects but would not ensure substantial protection for the overall stock. The highest overall survival that could be achieved would be 6 percent, but this rate could be much less because of the uncertainties.

DOI-160: It is the policy of the Commission to require mitigation for impacts resulting from new facilities or operational changes proposed during relicensing. Mitigation is not required for original or continuing impacts from existing projects. Instead, the applicant and resource agencies are requested to identify opportunities for enhancement or improvement of the resources associated with the project. Consequently, the premise of the applicant's wildlife improvement plan, which involves protection of about 900 acres of land and some habitat enhancement, is appropriate. The plan is inadequate primarily because it lacks a monitoring and maintenance program to ensure that improvement measures are effective and continued over the entire license period. In addition, the rationale for the propose measures to improve deer and elk forage appears to be weak. The staff-recommended measures in Section 4.1.4.2 are designed to address the inadequacie identified in the plan.

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DOI-161 cont'd: conditions. A significant portion of the increase in average annual habitat units shown in Table 4-10 can be attributed solely to this assumption.

DOI-162: Page 4-46., Restoration of Anadromy.:
This section should be expanded to note the value of each stage of the life history of anadromous fish, not just the fate of carcasses. Restoration of anadromous fish will also supply large numbers of fish eggs and juvenile fish to the ecosystem as a source of food, and of nutrients, providing a source of prey for mammals, fish, and birds.

DOI-163: Page 4-46., Paragraph 6.:
With the dams in place, carcass retention rates in the middle and lower Elwha River may be lower than the 96 percent value projected in this paragraph due to the reduced amounts of LOD below the dams.

DOI-164: Page 4-47., Paragraph 1.:
This paragraph should acknowledge that retained carcasses which are not eaten by wildlife scavengers may be consumed by aquatic insects, protozoans, etc., and are therefore valuable through enriching the aquatic ecosystem.

DOI-165: Page 4-49., Table 4-13.:
We concur with the conclusion that restoration prospects for spring chinook under the applicant's proposal are "poor". However, Table 4-13 should include spring chinook as well. Spring chinook would utilize the upper mainstem and larger tributaries for spawning. Spawn timing would be similar to those shown for fall chinook in Table 4-13. Actual spawn timing of fall chinook may be later than shown in Table 4-13.

DOI-166: Page 4-50., Paragraph 5.:
The NPS concurs with WDW's comment that "the applicant's plan provides only minimal habitat improvement for most species, and lacks an adequate monitoring program." We feel that the applicant's plan is overly optimistic for many species.

DOI-167: Page 4-51., Paragraph 3.:
Replace this paragraph with the following: "The staff also recommends implementation of maintenance and monitoring programs in consultation with the WDW and NPS. The maintenance program should ensure that habitat improvements (e.g., measures designed to promote the production of hydrophytic shrubs) are continued over the license period. The monitoring program should be designed to determine the success of the enhancement plan and should include goals, methods, evaluation procedures that are subject to periodic scientific peer review and modification, and contingencies if the program fails."

DOI-168: Page 4-52., Paragraph 2.:
Replace "...would temporarily disturb..." with, "...may temporarily disturb...."

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DOI-161: The staff recognizes that many of the benefits of the applicant's proposal result from the assumption that all of the timber on the land owned by James River would be harvested within 5 years. The Commission frequently uses the "worst case scenario" for analyses with a variety of options, and since much of the timber around Lake Aldwell is mature, there is no reason to assume that timber harvest would not occur within 5 years. If alternative timber harvest scenarios seem more reasonable, they should have been recommended for analysis by the HEP team, which included 2 representatives from DOI.

DOI-162: Section 4.1.4.2 has been expanded to include a discussion of the value of each stage of the life history of anadromous fish to aquatic and terrestrial systems.

DOI-163: Section 4.1.4.2 has been modified to indicate that although carcass retention along the lower and middle reaches of the Elwha River is difficult to predict, it is most likely less than the 96-percent retention rate calculated for smaller streams.

DOI-164: Section 4.1.4.2 has been modified to include the value of unconsumed salmon carcasses to the aquatic ecosystem.

DOI-165: Table 4-15 (Table 4-13 in the DEIS) includes only those species with calculated estimates of predicted escapement. A few spring chinook may be present but they may not be the original Elwha stock and it is unlikely that they have maintained genetic integrity because of probable co-temporal spawning with other chinook along the lower Elwha (see Section 3.4.3.1). A footnote was added to all of the tables presenting escapement data for biomass calculations to acknowledge the presence of spring chinook.

Existing information on the Elwha River indicates that fall chinook spawn from July through October, with the peak occurring from September through mid-October (see Section 3.4.3.1). Consequently, the information presented in Table 4-16 (Table 4-14 in the EIS) appears to be correct.

DOI-166: Comment noted.

DOI-167: Section 4.1.4.2 has been modified to include the suggested changes to the staff-recommended maintenance and monitoring program.

DOI-168: Section 4.1.4.3 has been modified to include the suggested editorial change.

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DOI-169

Page 4-53., Paragraph 1.:
Replace sentence 1 with the following: "Consequently, the applicant's wildlife improvement plan would provide marginal habitat improvements for the spotted owl over the next 50 years near Lake Aldwell, and essentially no habitat improvement near Lake Mills within the next 50 years.

DOI-170

Page 4-53., Paragraph 4.:
We concur that bald eagles would not benefit significantly under the applicant's plan because it contains no measures for the restoration of chum salmon, the primary species utilized by bald eagles.

DOI-171

Page 4-53., Paragraph 5.:
We agree with the conclusion that the applicant's proposal would not greatly increase bald eagle use of the watershed. However, coho carcasses would be utilized by eagles. Glock, et. al. (1980), discuss bald eagle use of coho carcasses, especially in years of low chum abundance.

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DOI-169: The applicant's wildlife enhancement plan would provide marginal habitat improvement for the spotted owl on land adjacent to Lake Aldwell primarily because existing forest stands would be protected from timber harvest for at least the next 50 years. The forests adjacent to Lake Mills are already protected because they are within ONP. Because it not feasible to force trees to grow faster, there is nothing that the applicant or anyone else can do to improve spotted owl habitat near Lake Mills over the next 50 years.

DOI-170: Comment noted.

DOI-171: Section 4.1.4.3 has been modified to include the reference to Glock et al. (1980) and to acknowledge that bald eagles feed on coho carcasses, especially in years of low chum abundance.

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DOI-172

Page 4-55., Paragraph 1.:
"Partial restoration" which is projected under the applicant's proposal cannot meet ecosystem restoration goals of ONP.

While the re-establishment of summer/fall chinook and coho salmon and steelhead trout would be an improvement over existing conditions (i.e. the total absence of anadromous fish) describing this as partially meeting the goal down plays the actual goal which is to re-establish the natural ecological processes in the upper basin. It is difficult to see how this can be achieved when 6 of the 10 anadromous fish stocks are omitted. Since these stocks are spatially and temporally separated for at least part of their life cycle, the failure to restore all stocks will leave functional voids that cannot be made up by those species.

DOI-173

Page 4-55., Paragraph 2.:
We do not consider the dam retention alternative as having a "minor adverse effect" on land use in ONP. The continuing inundation of Lake Mills precludes this area from the wilderness, biological, recreational, and aesthetic uses for which national parks were created. We consider this to be a major adverse impact.

DOI-174

Page 4-55., Paragraph 7.:
The opportunity to catch larger fish, even if fishery regulations call for release, should have a positive effect on the recreational fishery instead of the "slightly negative effect" that is concluded in the DEIS.

DOI-175

Page 4-56., Paragraph 2.:
Although the PFMC plan calls for reestablishment of wild, self-sustaining fish populations, implicit in this objective is the restoration of populations which contribute to recreational and commercial fisheries and do not require conservation closures which curtail existing fisheries (as discussed on page 4-60). The applicant's proposal would result in the establishment of several weak runs of salmon. Protection of these runs would require closures of existing fisheries along their migration route. Instead of contributing additional commercial and recreational benefits, this alternative would reduce them. Therefore this alternative is not consistent with PFMC's management plan.

DOI-176

Page 4-56., Paragraph 4.:
Although the applicant's proposal would restore some level of anadromous fish production to the watershed, it would not contribute substantially to restoration of the ecosystem. Biomass inputs provided by this proposal may be insufficient to significantly improve productivity of aquatic and terrestrial ecosystems.

DOI-177

Goals of ONP are not necessarily to "encourage high-intensity usage" in any area of the park. The distinction between "encouraging" use and "concentrating" use in park periphery areas is important to note. We do not wish to encourage use of Lake Mills, nor do we support substantial improvements to the Lake Mills boat launch (see comments regarding p2-13, above).

DOI-178

Page 4-65., Paragraph 1.:
The DEIS conclusion that "... it is unlikely that the marine harvest rate, which is approximately 80 percent at present, could be reduced much below 59 percent" needs further discussion. While the reduction of harvest is not likely to be popular among fishers, such measures are presently being taken to protect weak stocks (e.g. Hood Canal coho salmon). We question the assumption that any shortfall in escapement goals would be made up by restricting inriver harvest, particularly that of tribal fishers. While inriver tribal harvest has been restricted in recent years, it is unreasonable to assume in light of the Boldt decision that this situation will continue indefinitely.

DOI-179

Page 4-65., Paragraph 3.:
Total restoration of the ecosystem cannot be successful under the applicant's proposal. If fish restoration under the applicant's proposal is unsuccessful,

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DOI-172: The staff acknowledges the fact that the applicant's proposal does not fully meet the ecosystem restoration goals of ONP. However, restoration of chinook and coho salmon runs would re-establish a portion of the natural ecological processes in the upper basin and therefore partially meets the goal of ecosystem restoration.

DOI-173: Since the dam retention alternative would not dramatically alter existing uses, the future effects on land use would be minor.

DOI-174: If catch rates go down, even a moderate amount, it is unlikely that most anglers would be as satisfied with their experience.

DOI-175: The staff has concluded that the applicant's proposal would result in long-term recreational and commercial fishery benefits.

DOI-176: The text has been changed as indicated.

DOI-177: Section 4.1.5.2 has been modified as indicated.

DOI-178: Staff agrees that there are factors present that could lead to greater reductions in the marine harvest rate or fewer restrictions in the inriver harvest, but stands by its original assessment that marine harvest rates below 59 percent are unlikely and continued inriver restrictions are likely.

DOI-179: The staff agrees that total restoration is one of the criteria for deciding what alternative will be considered and also agrees that total restoration cannot be achieved with dams in place. The only way all stocks could be restored would be to remove the dams (Section 4.2.3). Restoring the wild stocks is a Commission goal. Lack of total achievement of this goal does not indicate that resources did not improve. Some restoration would occur with dam retention, thus, improving the existing conditions for wild stocks. The staff has considered the uncertainties of dam retention and dam removal alternatives. The Socioeconomics section does not deal with restoration of wild stocks, only the economic value, which was not one of the major resource objectives as defined in Section 1.4.

Refer also to responses CI-89, CI-90, CI-91, and NMF-57.

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other means of restoring the fish runs must be implemented. Continued partial funding of the WDF hatchery by the applicant, is not acceptable to NPS in the event fish passage fails. The NPS (through the JFWA) have indicated in a number of filings that ecosystem and fish restoration are the agencies' principal goals and there is only one means of achieving these goals. Earlier research had indicated that fish restoration could possibly be accomplished by two methods; state-of-the-art fish passage facilities or dam removal. More recent research has documented that only dam removal will accomplish restoration of all fish stocks. If the fish passage alternative contains numerous uncertainties regarding successful restoration, these risks should be clearly acknowledged and due consideration given to dam removal in the FEIS.

DOI-180

Page 4-68., Paragraph 2.:
See comment regarding page 4-65, paragraph 3.

DOI-181

Page 4-68., Paragraph 6.:
We agree with the DEIS that the "... effect on marine commercial, marine sport, inriver tribal, and inriver sport fisheries under the applicant's proposal would be predominantly negative (emphasis added) with some positive aspects."

DOI-182

Page 4-72., Paragraph 4.:
We disagree that fishery restoration alone, of any magnitude, would in any way "compensate" the Klallam for the loss of cultural values and practices caused by dam construction. The Klallam way of life has been disrupted for almost 80 years...spiritually, culturally, and economically. Removal of one or both dams now does not constitute compensation for 80 years of impacts.

DOI-183

Page 4-74., Paragraph 3.:
Citation of figures A-29 and A-33 do not make sense in this context.

DOI-184

We agree that the development of any dam removal alternative should include measures to reduce the quantity of reservoir sediments entering the middle and lower river. Conceptually, we support the approach presented in the DEIS which calls for stabilizing the sediments within the reservoir boundaries, instead of removing the sediments to an offsite location, as suggested by the applicant. The approach presented in the DEIS is fairly similar to an approach developed by the Lower Elwha Klallam Tribe's consultant, and presents a similar conclusion (i.e. that the control of reservoir sediments is achievable using existing technology).

DOI-185

Page 4-83., Paragraph 1.:
We concur that "... recovery of the Elwha River to levels comparable to upstream conditions is estimated at 2 to 4 years following the construction period." In view of the very depressed numbers of pink and chum salmon, the rapid recovery of the middle and lower river is an important consideration.

DOI-186

Page 4-92., Paragraph 3.:
Regarding impacts of dam removal on the Elwha Rearing Channel, consideration should be given to the current program of removing fish from the facility during the summer and early fall (due to high water temperatures and concerns with disease). Use of the facility during part of the year--rather than complete shutdown of the facility--might be possible if the construction period is confined to the summer months (as discussed on page 4-94).

DOI-187

Page 4-93., Paragraph 2.:
The DEIS presents an overly pessimistic outlook in its assessment of dam removal construction related impacts on resident and anadromous fish by characterizing the expected impacts as "moderate to severe." This outlook is not consistent with the background and supporting information presented in the DEIS. For example, the DEIS indicates that high suspended sediment loads would be transitory in nature, and would be sustained for a period of time ranging from several hours to several days." (pages 4-85 and 4-87). The DEIS also

DOI-180: See response DOI-179.

DOI-181: Comment noted.

DOI-182: Reference to compensation deleted.

DOI-183: Comment noted.

DOI-184: Comment noted.

DOI-185: The text has been changed in Section 4.2.1.2 to state that it will take 4 to 6 years from when the dams are removed for the river to recover based on typical rates for restoration of disturbed areas in the region. The removal period has been shortened to 3 years with only 2 active reservoir years so that fewer fish generations would be directly affected by the construction period.

DOI-186: A Ranney well has been added for the intake of water during dam removal (see Section 4.1.2.3).

DOI-187: The text has been changed in Section 4.2.3.1. Models of sediment indicate impacts will be as described.

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DOI-187 cont'd

acknowledges that most of the reservoir sediments consist of silt and clay which are not expected to settle out in the river, but would be carried through to the coastal zone (page 4-74).

Even sand, which in our view, presents a greater risk to the fishery resources, would pass quickly though the middle and lower river since the threshold flow necessary to transport cobble is estimated at 5,000 cfs, and "floods of 10,000 to 20,000 cfs occur about every year" (page 4-78). Finally, the DEIS indicates that the "highest impacts would occur in the reaches below the dams during the first year after Elwha dam removal when sand bed and suspended load would increase." However, the areas immediately below the dams presently provide only limited spawning because of the lack of suitable spawning substrate, and high winter flows should move most of the sand and finer sediment on through to the coastal zone. Also, with the dams removed, historic spawning areas would be accessible.

DOI-188

Page 4-94., Paragraph 1.:
High inputs of fine sediment can have an adverse impact on salmon eggs and fry, as the DEIS states. Such levels, however, are likely to occur only if stabilization measures prove to be ineffective. If the probability for slope failure is high, additional measures should be included to reduce the risk. Armoring the channel slopes should be considered as an additional preventive measure.

An important factor in assessing potential impacts seems to be missing from the discussion. The lower and middle reaches of the Elwha River are presently in a highly degraded condition, and provide limited spawning habitat. In the absence of corrective action, spawning conditions will worsen. We believe it is appropriate to take into account both the present and anticipated future conditions of the middle and lower reaches, as well as the additional spawning area upstream from the dams, when assessing potential risks of dam removal.

DOI-189

Page 4-95., Paragraph 3.:
The DEIS states that "... fish restoration will not begin during the construction period." However, restoration efforts could begin at least 1 year prior to the removal of Elwha Dam for coho and spring chinook salmon and steelhead trout because of their longer freshwater rearing requirement. Specifically, the fry of these species could be planted in the upper Elwha River prior to removal of Elwha Dam.

DOI-190

Page 4-96., Paragraph 2.:
We concur that following dam removal, the more active channel dynamics would result in the creation of more side channels. While coho and chinook salmon are identified as the principle beneficiaries, we believe chum and pink salmon will derive the greatest benefit. Lower gradient side channels with smaller sized substrate seem more suited for pink and chum salmon, although we expect all salmonid species to use these areas.

DOI-191

Page 4-96., Paragraph 3.:
The DEIS indicates that substrate composition in the middle and lower reaches should be highly suitable for all salmon species within 4 to 10 years following dam removal. This timeframe seems overly conservative in view of the large quantity of sediments passing through the system annually, and the large quantity of suitable spawning gravel that is potentially available. To further reduce the time needed for recovery, additional spawning gravel could be salvaged when the reservoir sediments are stabilized and stockpiled in a location where the river could transport and distribute it naturally.

DOI-192

Page 4-97., Table 4-16.:
The two columns contain the same numbers but show different totals.

DOI-193

Page 4-98.:
Overall, we concur with the conclusions on the restoration of anadromous fish stocks under the dam removal alternative (Table 4-17). However, the rating of

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DOI-188: The staff believes its assessment is valid.

DOI-189: See Appendix A, Part 3 and Section 3.3 for the restoration plan.

DOI-190: The text has been changed in Section 4.2.3.2.

DOI-191: The staff has changed the predictions about the time frame of substrate changes. The primary problem is not lack of gravel but the high quantity of fines in the gravel. Gravel storage will not solve the fine sediment problem.

DOI-192: The text has been changed in Section 4.2.3.2.

DOI-193: The staff believes the rating is suitable but acknowledges that the uncertainty for this stock is greater than others. Refer to responses DOI-154 and DOI-53.

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cont'd

"poor" for restoring sockeye salmon may be overly pessimistic if the kokanee in Lake Sutherland are found to retain the genetic makeup of the historic Elwha River sockeye. It also appears that the lack of tributaries with suitable spawning areas for sockeye salmon was a primary factor for the "poor" rating. Although lake spawning is not common, it does occur. A lake spawning population is known to occur in Lake Washington, and may be a suitable donor stock if the original Elwha River sockeye gene pool is determined to be extinct.

DOI-194

Page 4-98., Table 4-17.:
We generally concur with the FERC staff's assessment of fish restoration potential following removal of the dams. However, we believe projection of sockeye restoration prospects as "poor" is too low. Although the amount of sockeye spawning habitat may be limited, and the magnitude of a restored run may not be large, restoration of a self-sustaining population should be possible. In the FERC staff assessment, allowable harvest rate and available stock are rated as "marginal." However, harvest rates should be lower than other Puget Sound stocks for the reasons discussed for pink salmon (see comments regarding page 4-102). Although the native stock is extinct, there are other instances (Lake Washington) where sockeye restoration has occurred with a non-native stock

DOI-195

Page 4-99., Paragraph 3.:
Summer/fall chinook spawning and rearing habitat would be significantly improved with removal of both dams. Project removal would restore five miles of mainstem habitat now flooded by reservoirs and improve the substrate conditions in another 11 miles of mainstem area. We believe that recovery and improvement of this habitat is critical to restoration of summer/fall chinook.

DOI-196

Page 4-100., Paragraph 1.:
The restoration of the normal sediment transport processes will have a greater benefit to the restoration of the anadromous fish stocks than is indicated in the DEIS. While the DEIS acknowledges the expanded estuary would serve as a transition area that would be used by juvenile chinook salmon while acclimating to the higher salinity of marine waters, this function is only cursorily mentioned. The importance of the expanded estuary should not be discounted just because of its limited size since an extended period of rearing would not be necessary for salinity acclimation. Although the DEIS only mentions chinook salmon as benefitting from a restored estuary, all anadromous fish stocks can be expected to benefit. The restoration may be even more important to pink and chum salmon because they migrate to saltwater as fry, and lack the swimming ability of larger fish. The Elwha River near its confluence with the Strait of Juan de Fuca is presently relatively swift. If the Elwha River delta rebuilds over time, we would expect conditions to improve for pink and chum salmon because of the expected increase in lower velocity areas with intermediate salinities.

Although Phinney and Bucknell (1975) may have considered the Queets estuary to be "limited" for salmon utilization, chinook production from this river has shown very positive increases in recent years (PFMC, 1991) and is a principal producer of chinook. Such information should be reflected in this paragraph.

DOI-197

Page 4-100., Paragraph 5.:
While the lack of a pure native coho stock in the lower river may slow reestablishment of this stock, stock availability should not be considered only "marginally favorable." Policies of Departmental agencies, including the NPS, favor species restoration using native genetic stock. However, when these stocks are limited or not available, closely related stocks may be selected in lieu of no restoration at all. The Department does not advocate introduction of stocks into areas where no similar stocks previously existed. Nonetheless, successful examples of coho stocks being introduced (South Fork Skykomish and Deschutes Rivers), to areas where they had not been previously found are evidence of the restoration potential of this species.

DOI-198

Page 4-102., Paragraph 2.:
Winter steelhead spawning and rearing habitat would be "improved significantly", (rather than "improved slightly", as this paragraph indicates), with the removal

DOI-194: See responses DOI-193, DOI-154, and DOI-53. The harvest rate assessment changed, but the revision does not change the overall "poor" rating for restoration.

DOI-195: The text has been changed in Section 4.2.3.2. However, the staff does not believe that habitat quality increase in the middle and lower reaches are critical to restoration of these fish because the majority of stream habitats in the system would be in pristine condition and can be heavily used.

DOI-196: Comment noted; the text has been changed in Section 4.2.3.2. However, substantial runs can occur in high energy environments without substantial estuaries (e.g., the "limited" Queets River estuary). The overall importance of an estuary to production is not clear and may not be essential.

DOI-197: The staff believes the assessment criteria is valid. The South Fork Skykomish is one example but there are other examples of stock transfer from one region to another with reduced production or total failure (Withler, 1982). All non-native stocks have a reduced chance for success at restoration. If this were not the case, there would be no compelling reason to use native stocks.

DOI-198: The staff disagrees. About 70 percent of all habitat is in the upper region. This area will be mostly unaffected with dam removal. Spawning habitat exists in the lower region as indicated by substantial wild runs. There is also spawning habitat in the tributaries of the middle reach, so the improvements occurring in spawning habitats will affect a relatively small portion of the total system habitat. Based on these factors, the staff believes the rating is suitable as stated.

DOI-198 cont'd of both dams. Project removal would restore five miles of mainstem habitat now flooded by reservoirs and improve spawning and rearing habitat in another 11 miles through the restoration of natural gravel and LOD recruitment.

DOI-199 Page 4-102., Paragraph 5.: The Puget Sound pink salmon harvest rate of 60 percent probably does not apply to the Elwha River stock. The Elwha River lies west of the majority of this fishery which occurs primarily in the San Juan Islands and northern Puget Sound. Only a small percentage of the U.S. catch occurs in areas west of the Elwha River which is the probable migration route of returning fish. Although Elwha River pink are caught in gill net fisheries in the western portions of the Strait of Juan de Fuca and in ocean troll fisheries, the harvest should be lower than the composite Puget Sound rate.

DOI-200 Page 4-102., Paragraph 6.: It is premature to conclude that "... the Lake Mills inundation area is the expected upper limit of pink salmon utilization ...." (see comments for page 3-39).

DOI-201 Page 4-103., Paragraph 1.: Although the native pink stock is depleted and would be the most desirable for restoration purposes, other stocks are available. The nearby Dungeness River contains a pink stock which could be used in restoration.

DOI-202 Page 4-103., Paragraph 5.: Previous plants of chum into the Elwha River were composed primarily of Quilcene stock which is a late spawning population. The late spawn timing of this stock may not be appropriate for the Elwha River. We also believe that the poor spawning substrate in the lower river was a major factor in the failure of these previous attempts to build up this stock (see page 3-39). Therefore, we do not concur with the statement that "this process may take many years and may not be successful." A more appropriate statement would be that restoration appears feasible if an appropriate stock is selected from a nearby watershed and the spawning substrate is restored.

DOI-203 Page 4-103., Paragraph 6.: Restoration potential for sockeye salmon should be rated "fair" instead of "poor" as presented in the DEIS (see comments for page 4-98).

DOI-204 Page 4-104., Paragraph 4.: The conclusion that summer water temperatures could increase in the lower river following dam removal appears to contradict paragraph five on page 4-90. The discussion on page 4-90 indicates that maximum daily water temperatures would be 2-4° C cooler than existing conditions. These temperature reductions are attributed to the absence of reservoir heating and heat storage provided by Lake Mills.

DOI-205 Any reduction in invertebrate production due to fish spawning would be more than offset by increased primary productivity due to the presence of carcasses and unhatched eggs.

DOI-206 Page 4-105., Paragraph 6.: The "...potentially high mortality of naturally spawned salmon and steelhead eggs and fry in the lower reach" as discussed in the DEIS would result if slope failures within the drained reservoirs occur. This impact would be substantially reduced by including additional stabilization measures, such as channel bank armoring.

DOI-207 Page 4-106., Paragraph 5.: The plant which is referenced in this paragraph is Linanthus bicolor var. color. This species, within ONP, occurs in the lowlands on the north, northeast, and south sides of the park. Contrary to the statement in this paragraph, this plant

DOI-199: The harvest component reported for the Dungeness River indicated a 46 percent harvest rate before they enter the Straits (WDF, 1984). The Elwha River should have similar characteristics. The harvest profile for the Elwha River indicated another 14 percent harvest of the remaining run in United States waters (WDF, 1984). Current harvest could be different because this is older data, but the staff does not have the specific information to determine what it would be. Additionally, Jim Ames (personal communication, Washington Department of Fish, Harvest Management Biologist, Olympia, Washington, April 5, 1992) indicated that some unknown quantity of harvest occurs to Puget Sound stocks before they enter United States waters. The staff acknowledges that the exact harvest rate is unknown for the Elwha stock but believes that 60 percent is a reasonable value. The staff has added a statement indicating that harvest could be lower.

DOI-200: Some text changes have been made to Section 4.2.3.2. Although pink salmon may not be totally excluded from the area, extensive use of this region above Glines Canyon appears unlikely because pink salmon have a poor ability to traverse even small obstructions (Heard, 1991).

DOI-201: The staff agrees. Pink salmon from the Dungeness River could be used. However, as stated in response DOI-197, in the staff's view, any non-native stock has a significantly reduced chance of success at restoration.

DOI-202: Some text changes have been made to Section 4.2.3.2 for chum. Whether another stock would be successful is not known fully. The stock rating remains "marginal" in staff's opinion. Because of these uncertainties, the overall effect of this rating had minor effects on the overall rating for restoration, which still remains "good" even with this potential problem. Spawning substrate is not included in the discussion of stock suitability.

DOI-203: The staff disagrees, refer to responses DOI-53 and DOI-154, but has acknowledged that uncertainty exists.

DOI-204: See text changes in Section 4.2.3.2.

DOI-205: Comment noted. In the text, the staff indicated the impacts would be minor and short term.

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DOI-206: The text has been changed in Section 4.2.3.2. However, impacts will be severe in the short term with the proposed plan. The high sediment loads were also indicated with the plan developed by Summit Technology (1991) for the Lower Elwha Klallam Tribe. While the proposed armoring would reduce the chance for slumping events, it is very expensive so was not considered reasonable for the restoration plan. The plan proposed by the staff includes armoring the tributaries as a reasonable approach to reduce the sediment impacts. Considering the uncertainties of any of the plans, the staff believes the conservative assessment is valid.

DOI-207: Bicolored linanthus was on a list of plant species considered unusual or unique in the Elwha Valley that was provided to the Commission by ONP staff (letter to E. Schreiner, Botanist, ONP, from N. Buckingham, Botanist, February 6, 1990). Since ONP staff conducted an assessment of this species (December 1990) and no longer considers it locally rare, it has been removed from Section 3.5.3.5.

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cont'd is not considered "unique in the Elwha Valley." It does not qualify as a locally rare species in the park. (Detailed assessment of this, and other species, was conducted in December, 1990, by ONP staff).

DOI-208 Page 4-107., Paragraph 5.: It should be mentioned that new wetlands will no doubt also occur.

DOI-209 It does not seem reasonable to assume the sediment disposal terraces would be similar to gravel bars and quarry sites in terms of little or no organic matter, low fertility, and low moisture retention. It is likely that the higher silt content and the particulate organic material that has been retained within the reservoir would lead to very different conditions. Nevertheless, we agree that measures should be included to accelerate the establishment of native vegetation and the control of erosion.

DOI-210 Page 4-110., Paragraph 2.: While specific details are lacking in the DEIS regarding wetland restoration, ample opportunities for mitigating wetland impacts are available and can be implemented in conjunction with the restoration and stabilization of the former lake beds.

DOI-211 Page 4-112., Paragraph 1.: The revegetation discussion should emphasize the use of species and gene stocks which are native to the lower Elwha River valley. The same comments apply to p4-148 and p4-175.

DOI-212 Page 4-114., Paragraph 3.: While the reservoir areas may ultimately resemble pre-project conditions, it is doubtful that vegetation within the next 50-years will exhibit the habitat characteristics provided by mature and climactic vegetational species. In the near term, early successional species will dominate, and provide important forage for deer and elk. Since forage habitat for deer and elk near the reservoirs is of low quality, the addition of 715 acres of habitat dominated by grasses, forbs, and shrub species should be of much greater benefit than is indicated in Table 4-19, which evaluates the reservoir areas only in their climactic condition.

DOI-213 Page 4-115.: The values presented in Table 4-19 cannot be considered "average annual habitat units" unless it is assumed that for the period of the analysis the wildlife habitat remains constant in value. What is presented is a comparison of habitat value at one point in time for each of the two primary alternatives.

DOI-214 Page 4-120., Paragraph 2.: We concur that "... no long-term net loss of wildlife habitat would be expected with the dam removal alternative." In fact, we expect substantial improvements would result from removal of the projects.

DOI-215 Page 4-122., Paragraph 2.: The FWS agrees that the restoration of chum salmon runs would result in a significant benefit to wintering bald eagles.

DOI-216 Page 4-129.: Periodic closures of Olympic Hot Springs road during dam removal operations, and increased truck traffic on the Elwha Valley road are not viewed by the NPS or ONP managers as impediments to dam removal. Obviously, logistics of these operations must be coordinated with the park. Closures of this type for management purposes must be viewed in the context of the long range benefits.

DOI-217 Page 4-129., Long term impacts.: Restoration could result in some restrictions on the current Elwha River coho fishery which allows a very liberal bag limit of six adult fish per day. However, there has not been a recreational sport fishery for chinook in the Elwha

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DOI-208: The text mentions, in several sections, that new wetlands will most likely be created along the restored river through the existing reservoir areas.

DOI-209: The sediment disposal terraces in the delta areas of the reservoirs will be composed primarily of sand and coarse materials. Without any specific measures for revegetation and erosion control, these terraces would be expected to be similar to gravel bars and quarry sites in terms of organic matter, fertility, and moisture retention. The terraces in the lower portions of each reservoir would be composed of finer silts that would be more conducive to plant growth even without revegetation and erosion control measures. The text in Section 4.2.4.1 has been clarified to better distinguish between the two different types of sediment disposal terraces.

DOI-210: Comment noted. In Section 4.2.4.1, the staff recommends grading the sediments in the vicinity of the confluence of Indian Creek with the Elwha River to replace the largest wetland expected to be eliminated by the dam removal alternative.

DOI-211: Sections in the text that discuss revegetation (Sections 4.2.4.1, 4.3.4.1, and 4.4.4.1) have been modified to emphasize the use of species and gene stocks native to the lower Elwha Valley.

DOI-212: The staff agrees that the successional species that establish in the reclaimed reservoir areas will provide important forage for elk and deer. Section 4.2.4.2 has been modified to include the results of a HEP conducted on the habitat expected to establish in the reservoir areas within 50 years of dam removal. Based on this HEP, the study area would provide 1,224 and 1,396 AAHU's for elk and deer, respectively. These AAHU's represent projections of habitat quantity and quality and are not based on actual measurements.

DOI-213: The staff agrees. The HU's presented in Table 4-24 (Table 4-19 in the EIS) were inadvertently converted to AAHU's during a global change to add apostrophes to these abbreviations.

DOI-214: Comment noted.

DOI-215: Comment noted.

DOI-216: The temporary impact of road closures would primarily be felt by the users of the area, not necessarily the managers.

DOI-217: The inriver recreational Chinook fishery would only represent a very small portion as compared to the offshore recreational fishery.

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DOI-217 cont'd

River for many years, so no additional restrictions on season or bag limits could be imposed on the river fisheries. Any fishing time would be a benefit compared to the current closures.

The statement that steelhead fishing would be better in quality and quantity may be understating the significant benefits this alternative would provide to this fishery. Improvements in the winter steelhead fishery would be especially significant. The current fishery is concentrated at the mouth of the river around the Lower Elwha Hatchery outlet stream, is very intense, and is of short duration, usually declining after January. Restoration of steelhead into the middle and upper sections would greatly increase the area open to productive fishing, extend the season into April, and provide the opportunity to catch wild fish which generally offer higher proportions of large, trophy fish.

DOI-218

Page 4-130 to 131.: These paragraphs are particularly subjective. What basis exits for statements such as "The exposure of the barren, debris-strewn reservoir bottom would be highly offensive to most viewers", and "Visitors to the Elwha sub-district would not expect to view such an extensive construction operation in a national park...this would degrade the quality of the scenic environment and may turn away many visitors?" The third paragraph states, "...the replacement of vegetative covers to areas currently occupied by the reservoir would not be beneficial to the aesthetic environment." Value judgments such as these should be removed from the FEIS.

DOI-219

Page 4-131., Paragraph 3.: The opportunity to observe migrating and spawning salmon and steelhead trout should be included as an improvement of the aesthetic environment.

DOI-220

Page 4-132., Paragraph 1.: While the DEIS indicates that the dam removal alternative offers the greatest economic benefit to commercial, sport, and tribal fisheries, and for improvements in tribal social conditions, there is no mention of the related industries and support services (e.g. lodging, restaurants, fishing equipment suppliers, etc.) that would benefit from restoration of the anadromous fish runs. The restoration of depleted stocks (spring chinook, pink, and chum salmon) would also extend the fishing season. The greater opportunity to observe wildlife such as deer and elk, and large numbers of spawning salmon is expected to attract additional visitors to the Olympic National Park. These benefits should be included in the summary.

DOI-221

Page 4-132., Paragraph 5.: While the FWS agrees that the cost of power to the Daishowa America Mill would increase substantially over their present cost, we question the appropriateness of including the higher cost as a consequence of the dam removal alternative. The DEIS acknowledges that the cost of power under the dam removal or the dam retention alternatives would be nearly equivalent.

DOI-222

Page 4-132., Paragraph 6.: We concur that the removal of both dams would "... provide the greatest potential of restoring the various wild runs of fish to the river, as well as increase the fisheries harvest over present conditions ...."

DOI-223

Page 4-133., Paragraph 2.: Spring chinook are very highly valued by recreational fishermen because they return at a time when other salmonids are not available, they are very bright when they enter the river, and are hard fighters on sport tackle. Recreational benefits would be more than "nominal." With a return to naturally spawning salmon, the prospects of restoring the river's legendary large chinook would greatly increase. The opportunity to catch one of these trophy fish would be very attractive to sportsmen and would draw anglers from long distances to the river and marine areas near the mouth of the river.

DOI-224

Page 4-135., Paragraph 3.: Tribal employment at the Lower Elwha Hatchery would not necessarily be lost if the dams are removed and fish restoration occurred. The tribal hatchery could

DOI-218: The process of removing and reclaiming the Glines Canyon and Elwha projects would be perceived differently by each viewer. The text has been modified to acknowledge that different viewers would react differently to changes at the Elwha and Glines Canyon projects.

DOI-219: Observation has been added to text.

DOI-220: The benefits to recreation-based businesses has been added to the summary (Section 4.2.8).

DOI-221: The fact that the cost of power to the Daishowa America Mill would increase substantially under the applicant's proposal does not make it any less true that power costs would be substantially higher under the dam removal alternative. The intent of Section 4 is to indicate the effect of alternatives compared to the existing situation, not compared to each other.

DOI-222: Comment noted.

DOI-223: Section 4.2.8.2 has been revised to reflect this comment.

DOI-224: The text of Section 4.2.8.2 has been revised to reflect this point.

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DOI-224 cont'd — be used to supplement or rebuild salmon and steelhead populations in other Strait of Juan de Fuca streams.

DOI-225 — Page 4-137., Paragraph 6., Construction Impacts.:
An archeological survey should be conducted in increments during drawdown periods. Wave action may be one of the most useful tools to assist location of archeological sites during incremental drawdowns.

DOI-226 — Page 4-138., Paragraph 1.:
Again, we disagree that removal of both dams and subsequent fishery restoration would in any way compensate the Klallam for values lost from their way of life for over 80 years. See comment p4-72, p4, 18.

DOI-227 — Page 4-138., Paragraph 5.:
Reservoir excavation and dredging should not only be monitored by an archeologist, but an archeologist should also be consulted during the planning phases to develop an incremental survey strategy for the drawdown.

DOI-228 — Page 4-140., Paragraph 3.:
The estimated remaining useful life of the Elwha Project should be stated, taking into consideration the increased siltation.

DOI-229 — Page 4-144., Paragraph 2.:
We concur that under the removal of the Glines Canyon dam alternative "the prognosis for restoring runs of pink and chum salmon is poor because of passage problems and the continued degradation of spawning habitat in the lower river.

DOI-230 — Page 4-145.:
The rating of "favorable" in Table 4-22 for both summer and winter-run steelhead trout is questionable because the passage of steelhead kelts past the Eicher screen has yet to be evaluated.

DOI-231 — Page 4-149., Paragraph 4.:
While the upper Elwha River would benefit from restoration of chinook and coho, the most significant ecosystem benefits would result from restoring mass spawning pink and chum salmon. Restoration of these species is not possible if the Elwha Dam is not removed.

DOI-232 — Page 4-167., Paragraph 2.:
The FWS should be added to the list of agencies that should be consulted as the mitigation and erosion control plans are developed.

DOI-233 — Page 4-171., Paragraph 1.:
We believe the FERC staff is overly optimistic regarding fish restoration prospects with only the Elwha Dam removed, especially concerning pink, chum, and spring chinook. Certainly stating that "the overall restoration prospects would be similar to those associated with the removal of both dams" is misleading, particularly in view of continued habitat degradation below the Glines Canyon Dam.

Factors such as reservoir mortality in Lake Mills, lack of screening, increased water temperature, fish handling-stress in a trap and haul operation, and uncertain spillway survival remain as primary concerns. In addition to these passage problems, the mainstem habitat below Glines Canyon Dam will continue to degrade from its present unsuitable condition, negating many of the benefits gained by providing access. This habitat would be especially critical to pink, chum, and summer/fall chinook, and its further degradation may obstruct attempts to reestablish these species. The degraded condition of the habitat in the lower 16 miles of the river would reduce ecosystem and fishery benefits from summer/fall chinook and winter steelhead.

DOI-234 — Page 4-172., Paragraph 3.:
Under the Elwha Dam removal alternative, FERC staff includes spawning gravel augmentation and side-channel modifications as part of the recommended mitigation

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DOI-225: Because drawdown will mostly occur at the rate of about 1 foot per day, it is unlikely that the reservoir shoreline will have time to erode the 1 to 2 feet of silt that lines the reservoir inundation zone. Lake Mills will be drawn down to an elevation of approximately 490 feet and kept at that level for about 9 months. Since wave action may cut through the silt in this amount of time, the EIS text has been changed to include archaeological monitoring of the drawdown process. Dam removal will not affect most areas in the drawdown zone after drawdown.

DOI-226: Section 4.1.9.2 states that the applicant's dam retention proposal has a "reasonable potential of restoring four wild stocks of anadromous fish species." The restoration outlook under this alternative in the DEIS is fair for fall chinook, fair for coho, good for winter steelhead, and fair for summer steelhead (Table 4-4). The outlook for fall chinook has been revised to good. The Treaty of Point No Point granted the Klallam the right to one half of the harvestable fish catch within their usual and accustomed fishing grounds. The Klallam believe that the Elwha dam abrogated that right by reducing or eliminating some natural fish stocks and have preferred the dam removal alternatives on the basis that these are more consistent with their treaty rights than the dam retention alternatives. The reference to compensation has been deleted in the text.

DOI-227: It is not necessary, nor would it be productive, to develop an incremental survey strategy for the drawdown. This is because most of the drawdown would take place rapidly, at about 1 foot per day. Since the water would be drawn down over 1 to 2 feet of accumulated silt, there is very little likelihood that rapid drawdown would erode through this silt blanket and uncover archaeological sites. Drawdown at Lake Mills would be staged such that the lake level would be held at about 490 feet for 9 months. The shoreline at this stage would be monitored for archaeological sites, since shoreline erosion at one level for this length of time could expose and erode archaeological sites. The text has been changed to include drawdown as an activity that would be monitored.

DOI-228: It is estimated that with the removal of Glines Canyon dam, Lake Aldwell would fill in 40 to 60 years (Section 4.3.1.2). Because the reservoir is not used for water storage, filling would not hurt the useful life of the reservoir but would greatly complicate spillway and intake operations.

DOI-229: Comment noted.

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DOI-230: The staff does not believe kelt passage at the Eicher screens will be a problem. The system is designed to protect the very sensitive juvenile lifestage of salmon and steelhead and should more than adequately protect steelhead kelts. The passageways in the system are all larger than 1 foot in diameter and should allow easy passage of these fish.

DOI-231: The staff agrees. Section 4.3.4.2 has been changed to note that wildlife populations along the lower and middle river would not significantly increase with the removal of Glines Canyon dam because pink and chum salmon runs would not be restored.

DOI-232: Text has been added to Section 4.4.1.3.

DOI-233: Comment noted. The text has been changed in Section 4.3.4.2

DOI-234: The staff does not believe the lower river chum or pink salmon population is limited by gravel. More gravel in the area would increase the lower river spawning area, but it does not appear that this would increase run size. Even with gravel added to this region, it would not meet the goal of restoring runs of chum to the system because better than two-thirds of the potential habitat would be unusable because of the dams (only 5 out of 16 miles will remain usable because of poor reservoir passage). Because of current low runs, in spite of the more gravel than is needed, it appears other factors besides gravel are limiting the lower river chum runs.

Opening the middle reach will increase accessible habitat significantly and may reduce some of the other limiting factors, although the overall effects of other factors cannot be determined. This middle reach is low on suitable spawning gravel. In the staff's view, chum or pink salmon would not use this area without gravel additions. Input of gravel to this reach would increase usable habitat significantly but how successful such an activity would be is unknown. Because of these uncertainties, the overall rating for restoring pink and chum remains at best "fair," and without the gravel addition, the overall rating would remain "poor." In the staff's view, the potential benefits of doing some gravel addition to the middle reach for increasing the potential restoration of pink and chum justify the cost only with Elwha dam removal. This is not the case for the lower river (see Section 4.1.3.3).

Restoration of chum and pink in the river system with both dams in place even with the addition of gravel to the lower river would remain "poor." This is one of the reasons that it was not recommended in the staff additions to the applicant's proposal (see Section 4.1.3.3).

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DOI-234 cont'd

plan. It is unclear why it has been recommended under this alternative but not under the applicant's proposal, and this inconsistency should be addressed in the FEIS.

DOI-235

p4-179. P2. L4:
For the reasons cited regarding page 4-171, we believe biomass inputs to the river under this alternative may be exaggerated, especially with regard to pink, chum, and chinook. Again, the inability to restore pink and chum to their full potential would significantly reduce the amount of fish carcasses, unhatched eggs, and juvenile fish available in the middle and lower river sections.

DOI-236

Page 4-195., Paragraph 1.:
It does not seem reasonable to use the twin, 603 MW coal-fired units at Hermiston, Oregon to characterize the potential environmental impacts that would occur in order to replace the loss generating capacity of the Elwha River hydroelectric projects (28 MW rated capacity). We believe the worst case scenario would involve bringing a similar project on line earlier, not whether it is constructed.

DOI-237

Page 4-197., Paragraph 1.:
The DEIS indicates that failure to take positive action to restore the spring chinook run "... would likely ensure its extinction." Similar conclusions could be drawn for chum and pink salmon. In addition to spring chinook, pink salmon are also at critically low levels and retention of the dams may contribute to their extinction. We have concerns that a similar fate may await chum if the spawning substrate in the lower river is not rehabilitated. As these stocks continue to decline, nominations of these species under the Endangered Species Act may be considered.

DOI-238

Page 5-5., Section 5.1.1.:
As stated earlier (see comments p4-1. Section 4.1), we concur with the FERC staff's overall approach to determining fish restoration prospects. However, we believe the FERC staff analysis results in an overly optimistic assessment of fish restoration prospects because of unresolved habitat and passage problems with the dam retention proposals.

Under the applicant's proposal, degradation of spawning and rearing habitat in the middle and lower river would continue, greatly reducing the ecosystem and fishery benefits from summer/fall chinook, winter steelhead, pink, and chum. All of the expected spawning area for pink and chum and a large portion of the summer/fall chinook and winter steelhead habitat (except tributaries) is covered by reservoirs or impacted by a lack of suitable substrate and LOD. High uncertainty regarding fish passage also remains, especially for pink, chum, and chinook (see comments page 4-27, B-3, and B-8).

We believe fish restoration prospects would be generally lower overall than the FERC staff's assessment if the Glines Canyon Dam were removed. Removal of this dam would restore an additional eight miles of habitat for chinook, winter steelhead, pink and chum but the lower five miles would remain degraded. A great deal of uncertainty with regard to reservoir mortality in Lake Aldwell, questionable success of the Eicher screens for steelhead and chinook, and very unlikely passage success with pink and chum remain.

We would again rate prospects lower than the FERC staff's assessment if only the Elwha Dam were removed. We believe this alternative offers less chance of restoring meaningful numbers of fish and biomass than removal of Glines Canyon Dam. Although access would be provided into the middle river for all species, including pink and chum, the lack of improvement in the existing poor substrate would greatly reduce chances for restoring these runs. We believe that pink and chum utilized the river at least to the head of Lake Mills historically.

Removal of the Elwha Dam with retention of Glines Canyon Dam leaves all former spawning area for pink and chum (except tributaries) flooded, or degraded by armoring. Significant passage concerns would also remain for all species

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-235: The staff believes that there is a fair chance that chum and pink salmon runs would be restored if Elwha dam were removed and Glines Canyon retained. Estimates of salmon restoration that were fair or better were incorporated into the analysis of the effects of increased biomass on wildlife.

DOI-236: Section 4.5.1 has been revised to reflect the Council's current assessment of environmental effects from all conservation and generating resources that could potentially be affected in timing or level of development due to actions regarding the Elwha and Glines Canyon projects.

DOI-237: The text has been changed in Section 4.6.

DOI-238: The staff believes its overall assessment is valid based on the criteria. There are provisions in the staff's proposal for testing passage survival. The staff concurs that some stocks will not be restored with the applicant's proposal, and habitat will not be in "pristine" condition but will be much better than poor quality habitat. However, opening most of the pristine habitat above Glines Canyon dam to anadromous stocks will greatly enhance wild stocks that currently are only present in the lower river. While the overall rating for restoration remains "poor" for many stocks, it is likely that even some of these stocks will increase over what is currently present. Spawning habitat is poor in parts of the river, and some seeding of these areas for rearing will occur from successful upstream and tributary spawning.

Recent tests with Eicher screens indicate good passage survival with dams in place for all major stocks and lifestages. However, the successful passage of pink and chum through the screens is not known. This is not an important factor because these stocks will not be successfully restored above dams independent of juvenile passage through the Eicher screens.

The staff believes the rating of the Glines Canyon and Elwha dam removal are suitable as indicated. See Sections 4.3.3.2 and 4.3.4.2.

The staff believes the ratings accurately define the overall potential for restoration.

Provisions have been made through testing to improve some of the facilities. The staff does not believe the uncertainties are sufficient to change the ratings.

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DOI-238 cont'd

migrating past Glines Canyon Dam, especially due to reservoir mortality, lack of turbine screening, uncertain spillway survival, and potentially serious upstream passage mortality as a result of the trap and haul operation. Considering the inability to rehabilitate the middle and lower river habitat and high uncertainty regarding successful fish passage, the NPS would rate restoration prospects of the ten stocks of fish as follows:

	Applicant Proposal	Removal of Both Dams	Glines Canyon Dam Removal	Elwha Dam Removal
Fall Chinook	Poor 1/	Excellent	Fair/good 1/	Fair/poor 7/
Spring Chinook	Poor	Good	Fair/good 1/	Fair/poor 7/
Coho	Fair	Good/excellent 5/	Fair/good 1/	Fair 7/
Winter Steelhead	Fair 1/	Excellent	Good 1/	Fair 7/
Summer Steelhead	Fair	Good	Good	Fair 7/
Pink	Poor/None 2/	Good	Poor/None 2/	Poor 8/
Chum	Poor/None 2/	Good	Poor/None 2/	Poor 8/
Sockeye	Poor/None 3/	Fair 6/	Poor/None 3/	Fair 6/
Cutthroat	Unknown 4/	Good	Unknown 4/	Unknown 4/
Dolly Varden	Unknown 4/	Good	Unknown 4/	Unknown 4/

1/ Significant uncertainties, as noted by Commission staff, associated with reservoir, spillway, and Eicher screen passage and degraded habitat and water quality.

2/ Lack of a broodstock that will successfully survive reservoir passage and continued degraded habitat indicates there is little chance of successful restoration of these stocks.

3/ Lack of a broodstock and expected low probability of successful passage through Eicher screens makes restoration of sockeye unlikely.

4/ The ability of cutthroat and Dolly Varden to successfully navigate the proposed passage facilities is unknown.

5/ Existing coho stock should be adequate to restore run.

6/ Habitat should be rated as marginal.

7/ Significant uncertainties, as noted by Commission staff, associated with reservoir, and spillway passage, degraded habitat and water quality, and unscreened intake/turbine.

8/ Continuation of habitat inundation and degradation.

DOI-239

Page 5-7., Section 5.1.2.:
A principal goal of the NPS is restoration of natural ecosystem processes, including reestablishment of natural environmental conditions where possible. Restoration of these natural processes in the Elwha River ecosystem is dependent, in part, upon restoring numbers and varieties of anadromous fish that will have a significant impact on the productivity of the ecosystem. Without research, precise determination of escapement levels or biomass input which would be needed is not feasible. We believe that any "partial" fish restoration which may be possible under the applicant's proposal would be clearly inadequate to accomplish full restoration of natural biological processes.

DOI-239: Comment noted. The staff agrees that the applicant's proposal would not fully restore the natural ecosystem along the Elwha within ONP. However, it is an improvement over existing conditions and therefore at least partially contributes to this goal.

COMMENTS OF DEPARTMENT OF INTERIOR

DOI-239 cont'd

of particular concern in is the ability to provide a pulse of prey and nutrients. The mass spawning pink and chum salmon are especially important in this respect. These species would provide over half of the system's potential carcass and unhatched egg biomass. The other species of salmonids are equally vital due to differences in timing and habitat selection. These differences result in the distribution of carcasses over all the accessible portions of the watershed, throughout a large portion of the year, increasing their value as a source of prey available to a great variety of wildlife species. Juvenile salmonids also contribute an important food source for many animals.

Fish carcasses and unhatched eggs play another important ecological role in recycling nutrients from the ocean into freshwater ecosystems. Typically only 10-20 percent or less of eggs survive to the fry stage. The rest are eaten by other fish or die in the gravel. The combined nutrient inputs from carcasses and unhatched eggs have significant effects on basic productivity and may well increase subsequent fish production.

DOI-240

Page 5-7., Paragraph 2.:
See discussion for page 1-7, paragraph 2.

DOI-241

Page 5-8., Table 5-4.:
We feel that the assessment of "restoration of biomass" shown in this table is optimistic. Based on table 5-3 (these comments), we suggest revision of this table as shown below:

Alternative	Contributing Factors: Restoration of Glines Canyon Project area	Contributing Factors: Restoration of Biomass/ Wildlife populations	Restoration of ONP Ecosystem
Applicant's dam retention proposal	No	Poor	Partial
Removal of both dams	Yes	Good-Excellent	Full
Glines Canyon Dam Removal	Yes	Poor-Fair	Partial
Elwha Project Dam Removal	No	Poor	Partial

DOI-242

Page 5-8., Paragraph 1.:
There is no basis presented in the DEIS for the conclusion that the Elwha/Glines Canyon Projects reduce atmospheric pollutants in the region. Available power options discussed elsewhere in the DEIS indicate that effects of thermal power production are highly unlikely.

DOI-243

Page 5-10., Paragraph 6.:
The presence of a "regionally significant wild trout population" is an unnatural and undesired situation--inconsistent with management policies of the NPS--and is perpetuated by the lack of anadromous fish in the river.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-240: Comment noted. Section 4.2.1.2 has been modified to include an expanded discussion of the importance of nutrients provided by salmon carcasses throughout the year. Nonetheless, because the applicant's proposal would restore chinook and coho salmon to the middle and upper river, it represents an improvement over current conditions and restores a portion of the natural ecosystem processes to the Elwha River within ONP.

DOI-241: Restoration potentials of fair or better were assumed to contribute some salmon carcasses to the Elwha system. The second column in Table 5-4 has been changed to reflect the number of salmon runs with a fair or better restoration potential under each alternative. Restoration of coho and chinook runs would provide some amount of biomass but would only partially restore populations of wildlife that feed on salmon carcasses. Full restoration is dependent on restoring coho, chinook, pink, and chum salmon runs.

DOI-242: The EIS text has been modified to clarify that increased atmospheric pollutants is one potential effect of dam removal.

DOI-243: The trout stocks might be inconsistent with Olympic National Park Service policy, but this does not alter their presence and significance. The statement of their "undesirability" is the policy of the Olympic National Park Service. No statement of desirability is made in this section. However, the removal of the dams would reduce these populations and adversely affect a recreational resource that is currently present, whether an artifact of the blockage of anadromous stocks or not.

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Page 5-11., Paragraph 2.:

DOI-244 The phrase, "...the proposed wildlife enhancement plan would provide important protection and habitat improvement for most wildlife species using the lands owned by James River II in the vicinity of Lake Aldwell", is inconsistent with a statement made on page 4-50 of the DEIS which declares "The (FERC) staff concurs with the WDW that (the applicant's wildlife enhancement plan) provides only minimal habitat improvement for most species and lacks an adequate monitoring program." We concur with the WDW findings, and further note that the applicant's proposed wildlife enhancement plan would do absolutely nothing to mitigate wildlife impacts within ONP. We suggest that at a minimum the word "important" (line 3) be replaced with the word "some".

Page 5-11., Paragraph 3.:

DOI-245 Replace sentence beginning line 4 and remainder of paragraph with the following: "This increase in the amount of low elevation forest and riparian habitat would benefit a variety of species, including wintering deer, elk and (eventually) amphibians, spotted owls, marbled murrelets, marten and other old growth forest species as well. The dam removal alternative has a good-to-excellent chance of restoring salmon runs to the middle and upper reaches of the Elwha River. Consequently, this alternative, more than the others, would benefit wildlife that consume salmon carcasses, such as wintering bald eagles, bears, weasels, and a broad array of other species."

Page 5-12., Paragraph 3.:

DOI-246 Regarding the sentence, "in the short term, construction would create disruptions and closures affecting recreationists in the Elwha subdistrict of ONP". The FEIS should note that these operations would also provide opportunities for visitors to witness a "live demonstration" of ecosystem restoration.

Page 5-12., Paragraph 3.:

DOI-247 The sentence beginning line 4 should be followed by a sentence stating that other flat water boating opportunities are available on Lake Sutherland and Lake Crescent, located about 5 to 10 miles from the projects.

Page 5-12., Paragraph 6.:

DOI-248 See comments regarding page 4-131. We find this paragraph, particularly the sentence stating, "...the replacement of the blue waters of Lake Mills with an early successional forest on large terraces would be considered an adverse effect by most viewers" to be a subjective judgment and as such should be removed from the FEIS.

Page 5-13., Paragraph 1 & 4.:

DOI-249 Regarding property taxes paid to Clallam County which would be foregone if the dams were removed...the State, and the Federal government both have programs which allow payment in lieu of taxes. These are potential options for inclusion in a scenario of allocated cost responsibility (negotiated settlement), and would mitigate the county's tax losses. Although many details must be worked out before the applicability of these programs is known, the existence of these payment programs should be noted in the FEIS as information which can assist in the decisionmaking process.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-244: As suggested, the word "important" has been changed to "some" in Section 5.2.4.

DOI-245: Section 5.2.4 has been modified to include information on the benefits of dam removal to other wildlife species.

DOI-246: The staff believes that the benefits of the interpretive aspects of dam removal and associated area rehabilitation during construction would not compensate for the nuisance effects of construction closures, such as noise, dust, and use of heavy equipment.

DOI-247: The referenced paragraph has been left as a summary paragraph. Section 4.2.6.1. has been modified as indicated.

DOI-248: See response DOI-218.

DOI-249: The text of Section 5.2.8 has been shortened to focus on the primary effects of each alternative, and no longer references tax payments.

COMMENTS OF DEPARTMENT OF INTERIOR

DOI-250

Page 5-14., Paragraph 2.:
Please refer to the comment regarding p3-110, paragraph 5. Section 5.2.9 should note that 1) the National Historic Preservation Act does not preclude removal of registered properties, and 2) the significance of the projects should be evaluated in light of this statement (taken from the nomination of the Elwha Project): "any assessment of the historical impact of this plant must recognize the damage inflicted on both the native inhabitants and the natural environment."

DOI-251

Page 5-14., Paragraph 4.:
We find this paragraph to be misleading. Thermal plant impacts associated with removal of these projects are highly unlikely given the region's resource portfolio, and Pacific Northwest Electric Power and Conservation Act priorities. We recommend deletion of the paragraph.

DOI-252

Page 5-15., Paragraph 6.:
We agree that the alternative which is most consistent with area plans is the removal of both dams.

DOI-253

Page 5-17., Table 5-5.:
From the standpoint of ecosystem restoration, reducing what could be considered unnaturally high populations of resident trout in the upper river through competition from re-established salmon is not a "negative" effect. Suggested changes in the text:

- Applicant's Proposal--Decreased survival from competition with anadromous species in middle and upper reaches.
- Dam Removal Alternative--Large decrease from competition with anadromous species, but moderated by improved habitat condition in middle and lower reaches. Moderate decrease from turbidity during construction.
- Glines Canyon Dam Removal Alternative--Same as dam removal alternative.
- Elwha Dam Removal Alternative--Similar to, but slightly less than dam removal alternative.

DOI-254

Page 5-18., Table 5-5.:
Applicant's Proposal: Second Paragraph: Replace sentence 2 with the following: "Fair chance of locally benefitting wildlife populations that feed on salmon carcasses and live fish; poor-no chance of benefitting other, particularly old growth forest-dependent wildlife species."

DOI-255

Dam Removal Alternative: First Paragraph: Replace sentence 3 with the following: "Good to excellent chance of restoring wildlife populations that consume salmon carcasses and live fish, and restoring low elevation old growth forest and riparian habitats over time."

DOI-256

Page 5-21., Table 5-6.:
We note that the removal of both dams is the only alternative which is fully consistent with all comprehensive plans pursuant to Section 10(a)(2)(A) of the Federal Power Act. This fact should be noted in the text in the FEIS.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-250: See response DOI-112.

DOI-251: The EIS properly characterizes air quality degradation as a potential adverse effect from the loss of Elwha and Glines Canyon generation. The generating technologies listed are identified by the Council as playing a role in the region's resource base over the 20-year planning period under most load growth forecasts.

DOI-252: Agreement noted.

DOI-253: The text has been changed in Section 5.3.

DOI-254: Table 5-5 has been changed to include, under the applicant's proposal, "a fair-to-good chance of benefitting wildlife that feed on salmon carcasses and live fish." However, the remainder of the sentence was not included because the applicant's proposal would protect forest stands adjacent to Lake Aldwell that, over time, would benefit old-growth forest-dependent species (see Section 4.1.4.2).

DOI-255: Table 5-5 has been changed to include, under the dam removal alternative, "a good-to-excellent chance of restoring wildlife populations that consume salmon carcasses and live fish." The remainder of this sentence was excluded because all alternatives will eventually benefit old-growth forest-dependent species to some degree. The major difference between alternatives is the amount of additional wildlife habitat that will be available, which ranges from none for the dam retention alternatives to 715 acres with removal of both dams.

DOI-256: This statement would be true if the power plan aspects of the Northwest Conservation and Electric Power Plan were not added into the table. The staff has added the power planning aspects of the comprehensive plan to Table 5-6 and dam removal was found to be inconsistent with the plan.

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DOI-257

Page 5-22., Paragraph 1.:
We disagree with the contention of the sentence beginning on line 4 which states, "The three alternatives involving dam removal, on the other hand, would be generally consistent with ONP plans due to the achievement of restoration of all salmon species and/or the restoration of natural conditions on lands currently occupied by Lake Mills." Although the three alternatives involving dam removal are not inconsistent with ONP plans, we do not agree that restoration of the Lake Mills lake bottom, without the return of all anadromous fish stocks, constitutes "consistency" with ONP plans. The FEIS should note that removal of both dams is the only alternative which is consistent with ONP plans.

DOI-258

Page 5-23., Table 5-7.:
Refer to our general comments regarding "Economic Evaluation." We find that this table is misleading, and particularly for use in the summary section of the DEIS. Many additional costs are not shown nor mentioned in this summary table. These include, but are not limited to, the costs of FERC staff recommendations, projected costs (or savings) for Ediz Hook maintenance, and, at a minimum, a description of the non-developmental costs (or benefits) associated with each alternative. The columns which project total net costs and the value of foregone generation incorrectly assume a vested right to the revenue from project power. This is not a vested right; therefore, these columns should be removed from the table of cost comparisons.

DOI-259

Page 5-25., Paragraph 1.:
Replace sentence beginning line 1 with the following: "The applicant's proposal, while not providing a high degree of achievement of the restoration objectives, would result in some improvement over current conditions with respect to both fish and wildlife."

DOI-260

Page 5-25., Paragraph 2.:
Replace the sentence with the following: "Provide for potential anadromous fish access to the river reaches above the dams with a fair outlook for restoring 3 of the 10 stocks of salmon and trout having restoration potential." Also refer to the comments for table 5-3.

DOI-261

Page 5-25., Paragraph 3.:
The "important wildlife protection and habitat improvement" would not benefit ONP. The applicant's proposal contains no provisions for mitigation of effects on wildlife from the Glines Canyon Project within ONP, and this should be stated in the FEIS.

DOI-262

Page 5-25., Paragraph 4.:
The FEIS should make mention of other mitigation responsibilities the applicant must assume. These are for species, (such as estaurine shellfish), and processes (such as sediment transport and LOD recruitment into the middle and lower river), which cannot be restored through fish passage provisions. Other measures recommended by the FERC staff such as operation of Lake Mills as a run-of-the-river project, reevaluation of the spill program at the Glines Canyon Project, screens at Glines Canyon Dam, and additional monitoring and commitment to passage success should be reiterated at this point. Measures recommended by JFWA should also be included.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-257: Since the three alternatives provide for a return of some anadromous fish stocks, the staff believes this is a plan that is "working toward" consistency. The consistency determinations are not intended to be a choice between consistent and inconsistent but a description of degrees of consistency.

DOI-258: Refer to responses DOI-7 through DOI-9.

DOI-259: The text has been modified.

DOI-260: The proposed sentence is inconsistent with the staff's findings.

DOI-261: The comment is consistent with staff's findings. No text change is needed.

DOI-262: A table of staff-recommended measures has been added (Table 2-6), along with a table of agency recommendations (Table 5-10). The staff is unaware of any mitigation responsibilities that "the applicant must assume."

DOI-263 Page 5-25., Paragraph 7.:
The use of adjectives in phrases such as "extremely high costs", "technical challenges of a high order", and "very substantial adverse impacts" are subjective and inappropriate for use in a decision-making document. We disagree with these comments, and find them to be inconsistent with facts as presented in earlier chapters of the DEIS. In the FEIS more objective language should be used to present facts with no personal opinions regarding these facts.

DOI-264 Page 5-25., Paragraph 8.:
Refer to comments regarding economic evaluation, in the general comments above, and to those for p5-23, Table 5-7. The total costs of removing both dams is not based on the costs of 50 years of foregone power. Neither the applicant, nor any other entity, is entitled to revenues from this power.

DOI-265 Page 5-26., Paragraph 2.:
Regarding the sentence beginning on line 7 regarding high silt loads reducing production of fish stocks in the middle and lower river reaches; this should be identified as a short term effect. Based, in part on the return of anadromous fish production to the Toutle River, which carried extremely high silt loads following the eruption of Mount St. Helens, we are optimistic that substantial fish restoration is possible in spite of the short term effects of siltation.

DOI-266 Page 5-26., Paragraph 3.:
The Commission must also consider consistency of each alternative with treaty fishing rights, in addition to considering the "public interest".

DOI-267 Page 5-26., Paragraph 4.:
The alternatives of removal of one or the other of the dams do not result in a complete restoration of habitat (spawning gravels, etc.) to the river, nor is the ecosystem of ONP restored. We disagree that of the one-dam removal alternatives, removal of Elwha Dam is preferable. Removal of Elwha Dam may be cheaper, but is less likely to result in meaningful restoration of anadromous fish than is removal of Glines Canyon Dam.

DOI-268 Page 6-8.:
Amend citation:
Houston, D., E. Schreiner, B. Moorhead, and K. Krueger. 1990. Elk in Olympic National Park: will they persist over time? Nat. Areas. Jour. 10(1): 6-11.

DOI-269 Page A-49., Section 3.1.3.:
The revegetation process and growth of native planting stock should begin in year 0 or year -1 to ensure availability of adequate planting stock for the sites.

DOI-270 Page A-49., Paragraph 5.:
Replace sentence beginning line 6 with the following: "The seed mix should contain sterile forms of fast-growing grass (annuals, not perennials), and must be reseeded annually or biannually."

DOI-271 Page A-49., Paragraph 6.:
Willow wattles should be used in wet areas only, using native stock.

DOI-272 Page A-49., Paragraph 7.:
The "weed control program" must also include an active removal component.

DOI-263: The text has been reviewed for the presence of subjective unsubstantiated language. Some modifications have been made.

DOI-264: The estimation of the value of power that will be foregone if the dams are removed has nothing to do with entitlement. It is an additional cost the region will bear that is directly attributable to the loss of the projects.

DOI-265: The paragraph clearly states the duration of the sediment-related effects.

DOI-266: The referenced paragraph has been deleted.

DOI-267: The staff believes that Elwha removal is preferable with respect to the anadromous fish restoration objective, as measured by the number of runs restored.

DOI-268: The citation in Section 6.0 has been changed.

DOI-269: The Commission staff recommends detailed final design plans, after licensing, for the selected alternative which would identify nursery program schedules.

DOI-270: Comment noted. The staff recommends issues such as plant and seed selection be done as a part of final design in consultation with the respective agencies.

DOI-271: See response DOI-270.

DOI-272: See response DOI-270.

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COMMENTS OF DEPARTMENT OF INTERIOR

Pages B-2 to B-4.:

Passage survival through Lake Mills may easily be lower than suggested, owing to uncertainties in stream survival of chinook, lack of any actual data on survival in Lake Mills for chinook, and assumptions about outmigration behavior of Elwha chinook inferred from exit monitoring at Glines Dam. Estimating natural chinook survival in the upper Elwha is very uncertain. Using juvenile chinook survival in Idaho's Lemhi River as a basis may not be appropriate due to differing environmental conditions in that locale. No direct measures of juvenile chinook survival in Elwha streams are available, but fry plants of both coho and steelhead have suggested higher-than-average survival-to-smolt in the upper Elwha (2,7). Measures of summer-to-fall wild coho survival in the nearby Bogachiel and Queets Rivers averaged 33 percent (9). Even slightly higher freshwater survival prior to reservoir passage would markedly lower estimates of reservoir survival for the Elwha chinook.

DOI-273

The DEIS incorrectly assumes that no reservoir-related loss of chinook occurred in the 1989-90 chinook outmigration through Lake Mills. A protracted, late-summer outmigration of chinook would be expected to incur at least some reservoir-related mortality. Studies in the Columbia River (10) indicate that late-summer outmigration of juvenile chinook results in high reservoir-related mortality (over 60 percent in some instances) because: (1) predator activity is at its height; (2) chinook prey are relatively dispersed so predators are not "swamped" with prey as during the spring outmigration; and (3) downstream movement rates of chinook sub-yearlings are relatively slow compared to yearling and older smolts. Although warmwater predator species are not present in Lake Mills as in the Columbia, Dolly Varden and resident trout are predators of sub-yearling chinook, and they are relatively abundant in Lake Mills. Sixteen percent of Dolly Varden sampled in summer of 1989 in Lake Mills contained juvenile chinook from the 1989 upriver plant.

The estimated loss of juvenile chinook during the 1987 chinook outmigration may be underestimated. These chinook were released in the forebay of the reservoir in the immediate vicinity of the exits, and thus did not pass the length of the reservoir and encounter the full gamut of predators. In addition, the DEIS does not account for chinook passage which occurred between June 1 and June 15 of that year in the calculation of mortality. The Service file data indicate that an estimated 1,141 chinook passed through the dam during this period, which would result in a survival estimate of 68 percent rather than 71 percent.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-273: Natural mortality occurs in rivers and reservoirs. Two stockings of coho and steelhead in the Elwha showed above average survival, but one stocking did not (Wunderlich et al., 1989), suggesting future higher survival may not be a regular occurrence. These studies also do not indicate how chinook will survive in this system. The Big Springs Creek of the Lemhi system, where the summer survival studies were conducted, may not be exactly representative of the Elwha River system. This system was considered "productive" having high total dissolved solids (300 ppm) and stable flows because it is spring fed. These factors should help improve survival and growth in this system compared to the Elwha. However, during these tests, the number of fish in this creek were abundant and this could possibly reduce survival. This system did use fish of similar size in a stream environment for its estimate, which makes it reasonably characteristic of what may occur in that of the Elwha.

In the example cited for coho for summer to fall, 33 percent survival in a stream is nearly the same as the survival for chinook in the Elwha for a similar length of time. Therefore, it does not appear that 67 percent mortality is excessive for coho.

The staff feels the example of chinook in the Columbia River reservoirs mortality has merit but does not apply in this situation. The predator base is much different in the Columbia where it contains abundant warm-water species while the major predator in Lake Mills is Dolly Varden. Dolly Varden prey on chinook in the reservoir and also on chinook in the upper river. Whether predation would be higher in the reservoir or river is not known. Additionally, the characteristics of the reservoirs are much different. The John Day Pool is 76 miles long, having many shallows and backwaters and a much larger tailwater area. All of these factors increase the chance of predation on chinook stocks. The staff did not say that no mortality occurs in the river and reservoir, only that the mortality is not higher than what would be expected to naturally occur for a stock that spent that amount of time rearing before outmigrating.

Another example of inriver natural rearing mortality of fall chinook was presented for the North Fork Lewis River (McIsaac, 1990). McIsaac's (1990) studies found that fry (averaging 47 mm) to pre-smolt (average 58 mm) survival in the river was only about 10 percent. While these fish were much smaller than those stocked in the Elwha, they indicate that natural mortality before outmigration can be quite high, even among very viable stocks (the North Fork Lewis River Stock is about 85 percent of the total lower Columbia River wild fall chinook stock).

The staff has modified the 1987 mortality for the early-leaving individuals (see Appendix B). However, the staff does not think this value should be further reduced. These fish did not have to traverse the whole reservoir and most did not leave for several weeks after they were stocked. They were residing in the reservoir, not the river. If daily reservoir mortality were higher than in the river, these stocks would have been subjected to greater mortality than those in the 1989 tests. Also, surface spill stopped before all fish would likely have left, possibly increasing reservoir residualism and predation over what would have been measured if spill had been available.

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DOI-274

Page B-3., Paragraph 1.:

Spring chinook in Idaho's Lemhi River, where Bjornn conducted his study, are yearling outmigrants which rear in a stream environment over the summer. Summer-long rearing in this environment likely extracts a high natural mortality compared to downstream migrants in a western Washington stream. The chinook in the Lemhi may have been subjected to irrigation withdrawals, extremes in water temperature fluctuations, competition (both inter- and intra-specific) for available rearing space and food, and higher predation due to low clear water conditions. We suspect Bjornn's daily mortality rate may be too high relative to the Elwha River.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-274: See response DOI-273 The staff believes the Lemhi example is reasonable even considering the differences. The rearing length was about the same (80 to 90 days) and many of the fish after this rearing period outmigrated from the system. The fish were about the same size and of hatchery origin. The system was subjected to irrigation withdrawal but the description of the system by Bjornn (1978) indicated the major effect was to reduce spring peak flows. This system was spring fed, which increases the stability of flow. The clear water also increases the ability of fish to feed and improves instream primary production and food supply. The staff does not have information that indicates that the Elwha is excessively turbid in the spring and early summer. In fact, the Secchi disk measurements in Lake Mills in the summer 1987 were usually greater than 20 feet, indicating clear water. While daily temperatures at Big Spring Creek at times had wide swings, the average temperature was not excessively high, and upper temperatures were never even briefly in the lethal range for salmonids. Bjornn (1978) indicated that few resident large trout were left in the system because of the abundant steelhead, so predation from trout should have been minor.

Another example of mortality rate can be developed from the North Fork Lewis example. This example indicates an even higher natural mortality rate for rearing fall chinook than that of the Lemhi system. The rearing period for North Fork Lewis stocks from fry to pre-smolt was not indicated but most appeared after March and were gone by mid-June. If staff assumes a 90-day rearing period for these fish, the daily mortality rate is about 2.5 percent, about 50 percent higher than that developed for the Lemhi system. It would be expected that fry to pre-smolt survival would be lower, but probably not markedly, than the larger fish survival stocked in the Elwha. This suggests that the mortality rate applied for the Elwha River chinook is reasonable.

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Page B-3.:
Reliance on the late June date for chinook outmigration may be erroneous. The reservoirs may be contributing to a delay in outmigration timing. Bill Wood

DOI-275

(personnel communication, WDF) has studied chinook outmigration timing on several Washington coastal rivers. He found a spring build-up of chinook in mainstem areas until mid-May after which there was a rapid decline. By early July there were very few chinook fingerlings left in his sampling areas. He also found that most of these chinook were entering the estuary at 80-110 mm. If the reservoirs cause delays in downstream movement as we suspect, and mortality occurs at a near constant daily rate as assumed in the FERC staff analysis, the estimated 79 percent survival may be too optimistic.

An increase in the amount of spill over the applicant's proposed 100 cfs may be necessary. At the applicant's proposed spill level, gate openings would be only approximately 2.5 inches; these openings would be difficult for juvenile outmigrants to locate. Additionally, velocities through this narrow opening would be quite high, and could result in descaling and injury. An increase in spill level to attract outmigrants and reduce delay and mortality in the reservoir may also be necessary. Wunderlich, Dilley, and Knudsen (1989) found greater attraction of coho and steelhead smolts to the spillway as rates of spill increased.

DOI-276

Page B-3., Paragraph 2.:
The assumption of zero reservoir-related mortality should be reexamined. Studies in Columbia River reservoirs found higher predation rates in late summer on chinook fingerlings due to greater predator activity at this time of year, fewer prey targets since other salmonids had migrated downstream, and slower migration rates.

DOI-277

Page B-4., Paragraph 6.:
As noted in comments on page 2-13 above, passage survival may be lower than 98 percent with the extremely limited gate openings associated with 100 cfs spill. Because of the late-summer outmigration pattern of juvenile Elwha chinook, most of the population would be squeezed through an opening less than 3 inches high.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-275: Dilley and Wunderlich (1990) noted that even in the lower river rearing channel, Elwha River smolts displayed a late summer outmigration with "peaks in early August" when most of the volitional movement occurs, so Elwha River stocks may not be typical of coastal stocks. Because these hatchery stocks are fed in the hatchery, they grow larger than wild stocks. In addition, water temperature peaks sooner in the lower river. In the upper river, the smaller fish size and cooler temperature may delay outmigration of these naturally rearing stocks even longer than in the lower river. Also, late summer and fall migrations are known to occur in other stocks of chinook (e.g., some Willamette River spring chinook and Columbia River fall and upper river underyearling summer chinook). The delay in migration may have been affected by the fact that no spill occurred between September 6 to October 24 during what appeared to be a peak period of migration. The staff does not know if reservoir rearing of juvenile chinook is necessarily bad. In some Oregon reservoirs, chinook are stocked to use the reservoir as rearing habitat because of good growth in these environments.

The staff changed the mortality rate estimate for the small opening (see Appendix B). The staff has also recommended higher spill for the applicant's proposal. However, the velocity through a spillway gate opening of 35 to 40 feet per second is not high compared to other spillway gates where survival is considered good. The tests of survival at McNary and Big Cliff dams found velocity through the gate opening faster than 53 feet per second with only a 2-percent estimated mortality rate. However, the gate opening was 2 to 5 feet wider (Bell and Delacy, 1972).

DOI-276: Refer to responses DOI-274 and DOI-273.

DOI-277: Refer to response DOI-275.

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DOI-278

Page B-5., Paragraph 4.:
The 32 percent juvenile chinook salmon turbine survival figure quoted may be optimistic. The DEIS assumes that "during most fish passage the turbine would usually be operating at full capacity." This is not a good assumption because the bulk of juvenile chinook passage would occur during late summer when turbine capacity (1,100 cfs) is usually not met because of low inflow. The 32 percent survival figure is based on tests conducted at maximum flow only. As fish survival through the Francis turbine at Glines is dependent on operating efficiency, which in turn is related to flow, the effect of less-than-full-capacity generation on fish survival is uncertain. At low turbine generation in late summer, fish survival may be lower than 32 percent.

Survival percentage may also be lower than the DEIS states because of chinook size at time of passage. The turbine survival percentages quoted were obtained in the spring with fish of 72 to 76 millimeter (mm) forklength (4). The dominant size of chinook at outmigration would actually range from about 100 to 125 mm forklength in late summer when passage peaks at Glines (8). Such greater size at passage through Glines' Francis turbine would be expected to reduce fish survival (11).

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-278: Even if the turbines operate at less than full capacity and the fish are larger, turbine mortality is not likely to be higher than the estimated 32 percent. For this reason, the staff does not believe increasing the estimated mortality is warranted for different operations or sizes of fish. There are three major reasons that staff does not believe mortality factors need to be increased: 1) available information suggests that the 32-percent survival factor is already much lower than would be expected at this project; 2) the changes in efficiency may be offset by other factors; and 3) the size range of fish is relatively small and does not appear to be significant at this project.

Earlier studies of mortality found much lower turbine mortality at this project. Schoeneman and Junge (1954) found coho smolt and chinook fingerling survival of 70 and 67 percent, respectively, through the Glines Canyon turbines. Eicher Associates (1987) surveyed 20 studies of passage survival through Francis turbines and found significant relationship with turbine head and runner speed. Based on a regression of either of these factors, survival through the Glines Canyon turbines should be about 75 percent, not the estimated 32 percent. While there is not sufficient information to determine that the most recent turbine mortality test was in error, the combination of factors discussed above suggest that it may be too high.

Turbine efficiency and other factors are recognized factors affecting fish survival (Eicher Associates, 1987). Generally, it is assumed reduced efficiency results in higher mortality; however, the exact relationship is not known and other factors that also affect survival may also change with efficiency.

Fish sizes in the range of the fish above Glines Canyon dam are not likely to have greatly different mortality rates, and probably not higher than the estimated 32 percent. While there were some difficulties with the Schoeneman and Junge (1954) study, they did not find marked differences in mortality between fingerling chinook and coho smolts. This suggests that fish approximating the sizes of those outmigrants have little difference in survival at Glines Canyon dam.

COMMENTS OF DEPARTMENT OF INTERIOR

DOI 279

Page B-5., Paragraph 5.1
The final exit selection value obtained in the referenced study was 89 percent spill and 11 percent turbine passage (8). These values should be used instead of the values quoted. We note that the spill exit-selection value (89 percent) was obtained under run-of-the-river conditions with a higher minimum spill (175 cfs) and more frequent spill (24 hours per day during the spring and early summer) than the applicant proposes. Thus, the applicant's proposed spill and reservoir-level fluctuations may even further reduce the proportion of chinook choosing the spill exit.

DOI-280

Page B-6., Paragraph 5.1
The spill and turbine values should be 0.0125 and 0.9875, respectively, because chinook outmigrant timing in the Elwha is different than that of steelhead or coho, which the DEIS uses. The Elwha chinook outmigrant pattern is about 20 percent spring passage, 75 percent summer passage, and 5 percent fall/winter passage (8), whereas all steelhead and coho smolt outmigration occurs in the spring (2). Summertime chinook migrants would not have a spill exit available because flows do not exceed the capacity of the Elwha Dam's turbines. At other times of the year, the 95 percent turbine and 5 percent spill exit selection measured for spring-migrating steelhead and coho could be used to approximate exit selection. Therefore, chinook spill selection would be .20 X .05 (spring) + .75 X 0.00 (summer) + .05 X .05 (fall/winter) = 0.0125.

DOI-281

Page B-7., Paragraph 1.1
The cumulative passage survival may be lower than 99 percent based on available information. The referenced study (5) evaluated only coho smolt survival, and concluded that no substantial latent mortality was detected between short- and long-term survival estimates for coho smolts passing both dams. Monitoring studies indicate that chinook entered the Glines turbine at a somewhat greater rate than coho (11 percent versus 9 percent, respectively), and this would increase the likelihood of latent mortality because of substantial levels of scale loss and other injuries among fish passing the Glines turbine. As well, chinook passing via spill at Glines incurred higher levels of scale loss than did coho (4,7), and this potentially translates into higher latent mortality.

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-279: Even when no spill occurs, little movement occurs through turbines, so reduction of spill quantity is not likely to change the overall distribution of fish through turbines or spill. For example, from September 7 to October 23 when no spill occurred, only 2.3 percent of all outmigrants left the lake even though juvenile chinook appeared to be peaking in outmigration through spill just before this period.

DOI-280: See changes in Appendix B.

DOI-281: There is some change in mortality; however, differences are likely to be small between chinook and coho. Coho injury rates in the spill ranged from 10 to 67 percent while injury to the control fish was 10 to 40 percent in the 1988 tests (Wunderlich and Dilley, 1989). Chinook in the spill tests of 1987 had an injury rate (30 to 47 percent) similar to that of the earlier coho studies, but the control was lower (3 to 12 percent). Turbine-related injury was 20 to 40 percent (Wunderlich and Dilley, 1988). The reason that differences occurred between control of the coho and chinook studies is not clear; however, if control rates had not been different, the injury rate would be considered similar between the two stocks. The overall injury rate does not appear to be greatly different considering the accuracy of the studies. In the future, injury rates for chinook should be reduced from this study's rates because rocks have been removed from the plunge pool (which should reduce mortality), and because of increased frequency of spill, less fish will go through the turbines.

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DOI-282

Page B-8., Paragraph 2.:
Adult passage survival rates for Columbia River chinook may not be directly applicable to the Elwha River, especially with respect to spring chinook passing through a trap and haul facility at Glines Canyon Dam. Is the Columbia River survival rate based on ladders only or does it include trap and haul facilities? The Columbia River dams are much greater distances upstream from marine areas and most of the fish entering these ladders are more mature, permitting them to be handled with less mortality. We remain concerned with the stress and mortality associated with handling adult salmonids in a trap and haul operation located approximately 13 miles from saltwater.

DOI-283

Page B-9., Paragraph 7.:
Survival of coho smolts may be less than 32 percent through the Glines turbine because they are substantially greater in size than the fingerling chinook which were used in turbine survival testing. Size is an important factor in survival through the Francis turbine (11).

RESPONSES TO DEPARTMENT OF INTERIOR

DOI-282: The Columbia River values are for dam and reservoir passage only. However, the 10 percent value used is generally the highest value estimated. These estimates include fish losses while they are passing through much longer reservoirs than on the Elwha (for example, the 76-mile-long John Day Pool). Some other studies at ladders indicate survival could be much higher. The staff believes that the estimates are conservative even though they are based on ladders, not trap-and-haul facilities.

The South Fork Skykomish River has a trap-and-haul operation located relatively close to the salt water for transporting chinook stocks. It is 52 miles from estuary, much closer than any of the Columbia River dams. Although the staff is unaware of specific studies of migration rates in this system, even at a moderate speed, chinook could travel from salt water to this trap-and-haul in a few days. The difference in travel time between this and the likely future trap-and-haul operation on the Elwha at River Mile 13 seems small. It is probable that many summer/fall fish enter this system directly from salt water and ascend to the trap-and-haul operation in fashion not unlike that of a spring chinook. At the Skykomish River, 507 (in 1978) and 520 (in 1979) summer/fall chinook were transported over the falls with no reported mortality during transport (Seiler et al., 1981). Since this operation has been occurring, the summer/fall chinook run above this dam has increased in number in spite of heavy fishing and diverting a portion of the captures to hatcheries for brood stock (Seiler 1991; Seiler, personal communication, Washington Department of Fish, Fish Biologist, Olympia, Washington, December 20, 1991). This population increase suggests survival of transported adults is not a major problem. While there are differences between the two projects, the staff believes the similarities are sufficient to believe that the estimated adult passage mortality are reasonable.

DOI-283: Refer to response DOI-278.

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DOI-284

Page B-12., Paragraph 8.:
The same comments above for coho survival estimates apply here as well.

DOI-285

Page B-13., Paragraph 1.:
A better measure of steelhead exit selection was conducted in 1988 (7) when smolts from upriver fry plants were monitored throughout the outmigration season at Glines Dam. The DEIS correctly infers that other species (coho) were present during this monitoring period; however, these measurements were of smolts naturally outmigrating through the length of Lake Mills throughout the entire outmigration season. For this reason, it better reflects a natural outmigration pattern even though steelhead were not dominant. In contrast, the steelhead-only evaluation (3) cited in the DEIS looked only at hatchery steelhead placed in the Lake Mills forebay in the immediate vicinity of the Glines Dam exits. Work in 1988 (7), therefore, suggests a spill selection value of 91.2 percent for steelhead.

DOI-286

Page B-15., Table B-2.:
We recalculated model results for fall chinook and believe a lower rating ("poor") is more appropriate. A fall chinook restoration outlook of "fair" is borderline. We entered our suggested exit selection values for both Glines Canyon and Elwha Dams and found that, with only minor reductions in reservoir survival and/or long-term survival (1-3 percent), the model estimates less than 50 percent overall survival. Less than 50 percent survival implies a "poor" outlook for fall chinook restoration in the staff's approach, and this is a significant difference in model results. By way of example, any of the following reductions in survival variables yielded less than 50 percent overall survival according to the staff's model: (1) a 3 percent greater loss in reservoir passage through Lake Mills; (2) a 5 percent reduction in cumulative passage survival; or (3) a 2 percent reduction in both reservoir survival and cumulative passage survival. We also note that, among all input variables, the model is most sensitive to reservoir passage survival. Even minor reductions in expected reservoir passage survival (e.g. 3 percent as noted above) result in substantial differences in outcome. This variable is also the least well documented, as no direct measures of reservoir survival are available for the Elwha reservoirs.

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DOI-284: See response to coho survival in Appendix B.

DOI-285: See response NMF-101.

DOI-286: The staff believes the overall rating system including reservoir survival is reasonable, and not overly optimistic. In fact, the most complete test of chinook survival was in 1989, considering natural mortality. This would suggest that the overall reservoir passage survival used is conservative.

References:

(1) Wunderlich, R. and S. Dilley. 1985. An assessment of juvenile coho passage mortality at the Elwha River dams. U.S. Fish and Wildlife Service, Fisheries Assistance Office, Olympia.

(2) Wunderlich, R. and S. Dilley. 1986. Field tests of data collection procedures for the Elwha salmonid survival model. USFWS, FAO, Olympia.

(3) Dilley, S. and R. Wunderlich. 1987. Steelhead smolt exit selection at Glines Canyon Dam. USFWS, FAO, Olympia.

(4) Wunderlich, R. and S. Dilley. 1988. Evaluation of juvenile chinook and juvenile steelhead passage at Glines Canyon Dam. USFWS, FAO, Olympia.

(5) Wunderlich, R. 1988. Juvenile coho salmon passage at the Elwha River Dams: A comparison of short- and long-term survival estimates. USFWS, FAO, Olympia.

(6) Wunderlich, R., D. Zajac, and J. Meyer. 1988. Evaluation of steelhead smolt survival through the Elwha dams. USFWS, FAO, Olympia.

(7) Wunderlich, S. Dilley, and E. Knudsen. 1989. Timing, exit selection, and survival of steelhead and coho smolts at Glines Canyon Dam. USFWS, FAO, Olympia.

(8) Dilley, S. and R. Wunderlich. 1990. Juvenile chinook passage at Glines Canyon Dam, Elwha River, 1989-1990. USFWS, FAO, Olympia.

(9) Wampler, P., J. Anderson, and E. Knudsen. 1990. Evaluation of planting hatchery coho fry into streams containing wild coho fry. USFWS, FAO, Olympia.

(10) Reiman, B., R. Baemsdorfer, S. Vigg, and T. Poe. 1988. Predation by resident fish on juvenile salmonids in a mainstem Columbia reservoir: Part IV. Estimated total loss and mortality of juvenile salmonids to northern squawfish, walleye, and smallmouth bass. In T. Poe and B. Reiman (editors), Predation by resident fish on juvenile salmonids in John Day reservoir, 1983-1986. USFWS and ODFW Contract to BPA, Portland.

(11) Bell, M. 1984. Updated compendium on the success of passage of small fish through turbines. U.S. Army Corps of Engineers, North Pacific Division, Portland.

(12) Olson, F. 1990. Downramping regime for power operation to minimize stranding of salmonid fry in the Sultan River. CH2MHILL, Bellevue, Washington.

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COMMENTS ON TABLES AND FIGURES

DOI-287 Figure 2-1., Page 2-2.:
Roads on this map are indistinguishable from streams. Also, the ONP boundary should be shown extending to Port Angeles along the Heart of the Hills Parkway.

DOI-288 Figure 3-1., Page 3-2.:
The north, east, and south boundaries of ONP as shown on this map are out of date. The map fails to show the boundary for the coastal strip of ONP. Also, the map depicts Lake Crescent as outside the boundaries of the park. The park boundary actually lies north of Lake Crescent.

DOI-289 Figure 3-14., Page 3-72.:
The project boundary and lands for the Elwha Dam are not the same as shown on maps obtained from FERC.

DOI-290 Figure 3-15., Page 3-74.:
The ONP boundary should be shown extending to Port Angeles along the Heart of the Hills Parkway.

DOI-291 Table 3-16., Page 3-91.:
Listing these sites in upstream or downstream order would be helpful.

DOI-292 Figure 3-16., Page 3-82.:
Same comments as those for Figure 3-1, Page 3-2.

DOI-293 Figure 3-17., Page 3-92.:
Same comments as those for Figure 3-15, Page 3-74.

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DOI-287: Figure 2-1 has been modified to more correctly depict the park boundary near Port Angeles. Since color is not being used, it is difficult to distinguish between the roads and the streams; however, each feature has been clearly labeled.

DOI-288: Figure 3-1 has been modified as indicated.

DOI-289: The staff knows of only one project boundary, as indicated in Figure 3-14

DOI-290: Figure 3-15 has been modified as indicated.

DOI-291: The staff feels that the general location of each grouping is clearly labeled. Since key view areas are not necessarily from or focused on the river, ordering them based on upstream or downstream locations might take them slightly out of context.

DOI-292: Figure 3-16 has been modified as indicated.

DOI-293: Figure 3-17 has been modified as indicated.

COMMENTS OF CLALLAM CO. ECONOMIC DEVELOPMENT COUNCIL

CLALLAM COUNTY
ECONOMIC DEVELOPMENT COUNCIL

102 E FRONT • PO BOX 1085 • PORT ANGELES, WA. 98362 • (206) 457-7793

June 26, 1991

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street
Washington, D. C. 20246

RE: Draft Environmental Impact Statement, Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington

Dear Ms. Cashell:

We appreciate the opportunity to comment on the Commission's Draft Environmental Impact Statement (DEIS) on the Elwha River dams. The Clallam County Economic Development Council's membership has followed the Elwha Dams relicensing issue with great interest and concern. As they evaluate the options of dam removal or retention with all the associated impacts, their concensus favors dam retention with sound fish restoration and harvest management.

Our questions and concerns with the DEIS are as follows:

EDC-1

Water Quality and Quantity: Water quality, especially as it relates to public water supplies, was not given priority status as a resource objective and thus is addressed somewhat perfunctorily. The City of Port Angeles has addressed these concerns in great detail in their response to this document, and our members second these concerns.

EDC-2

Multiple Beneficiaries: There is an assumption throughout the document that the Daishowa America company is the only beneficiary of the dams. The response from the City of Port Angeles documents a much longer list of beneficiaries, including the ITT Rayonier mill, which depends on high quality water in the industrial water line, the Dry Creek Water Association, and all the residents of Port Angeles whose water and power rates are lower than they would be if the dams were removed.

RESPONSES TO CLALLAM CO. ECONOMIC DEVELOPMENT COUNCIL

EDC-1: Comment noted. Water quality concerns, especially with respect to industrial users, have been addressed in greater detail in Sections 4.2.2.1, 4.2.2.2, and 4.2.2.3.

EDC-2: There is no reason to believe that the dams affect local power rates, whether they are in place or removed. With respect to water rates under the dam removal alternative, the FEIS includes the cost of maintaining the quality of the municipal and industrial water supply as part of the dam removal mitigation package (Appendix A, Table A-27), which would be paid for by the entity charged with removing the dams.

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EDC-3 Complete Economic Analysis: The economic summary analysis, Table 2-12, does not include all costs associated with the various alternatives. It is especially important that this summary table be quite detailed and complete, because it is from this that major conclusions will be drawn. In some instances, costs referenced in the document, such as lost tax revenues, are not included. Other costs, such as water quality mitigation outlined by the City of Port Angeles, must also be included. We question the calculation for fisheries restoration in Tables 2-5,7,8,and 9, which are then included in the summary calculations in Table 2-12. In the absence of a fisheries restoration plan, how was the cost figured?

EDC-4 Power Rate Uncertainty: Power cost projections are based on work done before Columbia River salmon runs were proposed for threatened or endangered status. Mitigating measures necessary to preserve fish runs may result in higher power rates throughout the Bonneville system. We understand that this situation is full of uncertainty, but DEIS should include some acknowledgement of the strong likelihood that replacement power costs will be higher than those currently projected.

EDC-5 Financial and Technical Risks: We have always been concerned that the dam removal alternative involves a major commitment of funds by as yet unspecified parties, a major disruption of the existing environment and some unknown degree of risk if all the goals (including maintenance of water quality and quantity) are to be met. While dam removal proponents talk of a "win-win" situation with fish restoration and a healthy economy, we can also see a "lose-lose" scenario. This could happen if the dams are not relicensed causing power and water customers to lose their benefits, and then the removal and restoration plan also fails. Such a failure could result because dam removal, silt stabilization or fish restoration methods just don't work or, more likely, that success will cost more than projected, and funds will run dry.

EDC-6 Any private party proposing a project of this magnitude with this many interests at risk would be required to accept a long list of permit conditions before project approval was issued. These would typically include bonding requirements to ensure financial capability to finish the job as promised, as well as agreements in place with participating or affected parties covering commitments or liabilities. Although the proponents of dam removal are public agencies, we feel there should be comparable conditions packaged with this alternative. At a minimum, these

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EDC-3: See response CI-96. The table has been renamed and the supporting text now clarifies the limitations of the cost analysis to ensure that the reader appreciates the fact that cost information must be considered in the context of the many environmental effects described throughout the EIS. The costs of water quality mitigation for water supplies is now included. The cost of fish restoration has been revised based on additional staff analysis.

EDC-4: These concerns are expressed in EIS Section 1.4.3.1.

EDC-5: Concerns with dam removal are noted.

EDC-6: The staff has requested such a plan from the responsible resource agencies, but has received no substantial response. The staff has prepared a general restoration plan for the fisheries resources in Appendix A, Part 3.3.

Water quality mitigation measures are described in Section 4.2.2.3 to minimize impacts of adverse sediment levels on users of Elwha River water. The costs of these mitigation measures are also included in Appendix A, Table A-27.

Suggested conditions of dam removal are noted.

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EDC-6 cont'd must include a detailed fish restoration and harvest management plan, water quality mitigation plans, long term replacement power commitments, and assignment of liability in the event of failure, e.g., a silt washout. All of these must include enforceable financial commitments.

EDC-7 We have made several corrections and updated figures for Section 3.9.1 Social Characteristics. They are attached with tables verifying the corrections.

In the county which will suffer the greatest negative effects of spotted owl protection and timber export reductions, we cannot support additional stresses to our basic economy. The high paying jobs at the Daishowa mill are increasingly valuable to us as other manufacturing jobs disappear. Falling public revenues resulting from less timber activity will leave local governments without the financial resources to develop new water intake and treatment systems. Tourism and fisheries will not generate comparable income and public revenues.

We know that you appreciate the complexity of this issue. Thank you for your consideration of our comments.

Sincerely,

Judith St. Claire

Judith St. Claire
Executive Director

enc
cc: Senators Slade Gorton and Brock Adams
Representative Al Swift
Governor Booth Gardner

EDC-7: Comment noted. See also response CCC-8.

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Corrections to Section 3.9.1 Social Characteristics

EDC-8 Population: The 1990 Census gives the county's population as 56,464. While the retirement age population has certainly grown, the 65-plus population is still in the minority, 16% in 1990 and projected at about the same in 2000. Your conclusion at the top of page 3-101 may be true of those new retiree residents, but it ignores the continuing need of the vast majority for a healthy, balanced economy. Table A shows the Washington Office of Financial Management's 1989 forecast by age cohort for Clallam County.

EDC-9 Employment: Employment increased from 14,900 in 1985 to 17,850 in 1990, a 20% or 4% annual average increase. Our figures from the state Labor Market Information office show that trade, construction and government were the fastest growing employment sectors, with pulp and paper showing relatively low growth. The major reason for growth in the government sector has had little to do with the older population and a great deal to do with a new state Corrections Center at Clallam Bay. School employment has also increased. Table B summarizes Employment by Sector and Total Labor Force from 1985-1990.

EDC-10 We are puzzled by the paragraph on page 3-101 quoting figures provided by our agency on tourism industry impacts. We use figures compiled by the Washington State Department of Trade and Economic Development, and they're nothing like those quoted. Figures for 1989 are now available, showing total travel expenditures of $68 million, a travel-generated payroll of $12.2 million (about 4% of total county payroll), and travel-generated employment of 1,660 (about 9% of total county employment). Tables C and D show the 1987 and 1989 Economic Impact of Travel for the Olympic Peninsula, including Clallam County.

EDC-11 Income: 1988 figures are available for personal income. Table E shows total income by source and per capita income figures for Clallam County compiled from Bureau of Economic Analysis publications.

Our figures do not support the conclusion in the DEIS that Clallam County's per capita income is catching up with the state's. The line labelled "% of WA" on Table E compares the county's per capita income to the state's. It shows a decline relative to the rest of Washington.

Table F shows the county's Median Household Income for a similar period, also compared to the state. It, too, shows a growing gap. When inflation is factored out, the county's Median Household Income has actually declined.

RESPONSES TO CLALLAM CO. ECONOMIC DEVELOPMENT COUNCIL

EDC-8: Section 3.9.1 has been revised to include the updated figures, and the comment about retirees has been deleted. Staff appreciates the commentor's inclusion of updated information that facilitates revisions to the EIS.

EDC-9: Section 3.9.1 has been updated to include the more recent employment figures. In the case of construction, a dramatic increase in employment took place between 1988 and 1990, bringing that sector into the group of faster growing sectors. Pulp and paper manufacturing, showing an 8 percent increase over the 5-year period between 1985 and 1990, showed an intermediate growth. Reference to growth in the government sector due to the state Corrections Center has also been added.

EDC-10: The tourism-related expenditure and employment data have been revised to reflect the updated information. Staff, too, is puzzled by the incorrect figures included in the DEIS.

EDC-11: The conclusion noted in the DEIS was true if one looked at the period 1980 to 1986, but false when comparing 1980 to 1988. The FEIS indicates that the county ranged between 86 and 90 percent of the state average between 1980 and 1988.

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EDC-12 In summary, the DEIS portrays an economy with rosy prospects independent of a manufacturing base. The figures do not support this assessment. Past losses in manufacturing jobs have created an income gap between Clallam County and the rest of the state, in spite of more retirees and tourists. This makes retention of any remaining high-paying manufacturing jobs even more important.

EDC-12: The final paragraph of Section 3.9.1 has been revised to provide a more balanced perspective on the source of local income, noting the decline in the percentage accounted for by earned income.

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<u>**EXHIBIT**</u>

TABLE A

Table 19 (Continued)
Total Population by Age for the State and Counties

Age Group	Adams 1989	Adams 1990	Adams 1995	Adams 2000	Asotin 1989	Asotin 1990	Asotin 1995	Asotin 2000	Benton 1989	Benton 1990	Benton 1995	Benton 2000
0-4	1420	1426	1380	1308	1376	1369	1320	1246	9332	9295	8799	8199
5-9	1258	1269	1251	1219	1439	1439	1411	1367	9109	9108	8793	8404
10-14	1021	1063	1175	1166	1241	1278	1407	1390	7485	7731	8369	8158
15-19	986	954	981	1092	1114	1070	1094	1212	7197	6912	6949	7601
20-24	755	759	692	717	1060	1055	960	989	7064	7052	6299	6397
25-29	1042	1023	902	831	1335	1299	1140	1044	9615	9366	8077	7299
30-34	994	1001	929	826	1316	1311	1213	1074	9813	9805	8908	7775
35-39	1006	1027	1060	992	1313	1327	1359	1266	9648	9771	9873	9072
40-44	1018	1074	1176	1225	1263	1319	1440	1488	8655	9057	9717	9941
45-49	813	857	1104	1219	1015	1058	1358	1493	6336	6620	8349	9053
50-54	672	694	880	1141	793	811	1024	1324	4818	4938	6136	7814
55-59	548	546	597	765	673	664	723	922	3803	3760	4027	5053
60-64	528	522	494	545	804	786	738	809	3430	3361	3108	3363
65-69	431	436	397	379	857	857	778	740	2957	2961	2648	2478
70-74	331	336	360	334	740	744	796	732	2156	2166	2279	2068
75-79	271	280	297	322	574	588	619	672	1357	1394	1438	1540
80-84	158	163	193	205	378	383	447	477	724	737	844	889
85+	143	149	172	208	312	320	369	443	599	615	697	822
Total	13395	13579	14040	14494	17603	17678	18196	18688	104098	104649	105310	105926

Age Group	Chelan 1989	Chelan 1990	Chelan 1995	Chelan 2000	Clallam 1989	Clallam 1990	Clallam 1995	Clallam 2000	Clark 1989	Clark 1990	Clark 1995	Clark 2000
0-4	3391	3447	3397	3273	4328	4330	4216	4014	18873	19027	19252	19121
5-9	3237	3302	3317	3279	4087	4106	4078	3980	19522	19754	20386	20764
10-14	2957	3117	3512	3539	3489	3621	4031	4013	16751	17511	20264	21049
15-19	3151	3089	3233	3655	3443	3323	3435	3837	14975	14555	15642	18232
20-24	2846	2902	2699	2831	3364	3374	3098	3213	13234	13373	12772	13818
25-29	3621	3601	3233	3020	4344	4251	3771	3482	18018	17766	16378	15778
30-34	3610	3679	3481	3142	4480	4499	4204	3749	21485	21715	21097	19618
35-39	3639	3762	3954	3755	4158	4230	4393	4125	20770	21290	22998	22520
40-44	3730	3984	4450	4695	3755	3947	4356	4551	17135	18145	20812	22660
45-49	2958	3153	4141	4641	2933	3079	3997	4424	11947	12633	17029	19676
50-54	2408	2520	3256	4290	2503	2577	3291	4283	9279	9624	12784	17352
55-59	2257	2279	2536	3291	2474	2457	2699	3462	7784	7790	8913	11920
60-64	2425	2427	2330	2604	2949	2902	2757	3045	7985	7918	7814	9002
65-69	2520	2577	2398	2317	3143	3163	2910	2782	7713	7823	7481	7447
70-74	2147	2202	2413	2260	2329	2349	2543	2354	6025	6117	6891	6656
75-79	1716	1799	1936	2142	1737	1790	1907	2080	4308	4471	4935	5638
80-84	1119	1166	1386	1509	951	974	1146	1237	2491	2571	3145	3533
85+	874	918	1081	1320	728	750	875	1054	2103	2188	2648	3331
Total	48606	49924	52753	55563	55195	55722	57707	59685	220398	224271	241241	258115

Age Group	Columbia 1989	Columbia 1990	Columbia 1995	Columbia 2000	Cowlitz 1989	Cowlitz 1990	Cowlitz 1995	Cowlitz 2000	Douglas 1989	Douglas 1990	Douglas 1995	Douglas 2000
0-4	266	256	240	219	6567	6841	6444	5974	2121	2148	2142	2100
5-9	292	283	269	251	7052	7085	6807	6471	2065	2099	2135	2147
10-14	276	276	294	282	5726	5915	6374	6176	1772	1861	2122	2176
15-19	233	216	215	230	5509	5295	5296	5762	1696	1656	1754	2020
20-24	132	128	111	111	4988	4982	4432	4472	1406	1427	1343	1434
25-29	253	238	202	181	6485	6320	5425	4875	1951	1930	1757	1668
30-34	299	289	258	220	7157	7152	6468	5612	2236	2269	2174	1996
35-39	303	297	295	266	6922	7011	7049	6440	2375	2444	2601	2513
40-44	294	299	315	315	6121	6407	6541	6946	1955	2030	2351	2524
45-49	235	238	295	315	4752	4967	6235	6722	1652	1753	2331	2656
50-54	224	221	270	338	3801	3898	4821	6106	1174	1221	1603	2146
55-59	216	207	216	266	3268	3233	3441	4297	1020	1025	1157	1526
60-64	250	237	214	230	3309	3244	2981	3208	1039	1035	1008	1148
65-69	232	225	199	183	3299	3308	2944	2737	1059	1080	1018	1002
70-74	218	212	221	196	2788	2801	2935	2645	795	810	900	858
75-79	166	165	169	178	1932	1984	2039	2173	578	604	661	741
80-84	120	118	134	138	1112	1135	1293	1354	285	296	356	395
85+	91	90	101	116	982	1012	1140	1337	212	221	264	327
Total	4100	3995	4018	4035	82100	82590	82965	83307	25391	25959	27677	29377

OFM/Forecasting 7/89

EXHIBIT

TABLE B

EMPLOYMENT BY SECTOR — CLALLAM COUNTY

	1985	1986	1987	1988	1989	1990	%CHG 85-90
Manufacturing	2,940	3,063	3,087	3,046	3,120	3,000	2%
--lumber/wood	1,840	1,904	1,870	1,772	1,680	1,510	-18%
--pulp/paper	750	780	770	810	820	810	8%
Construction	740	584	566	650	800	930	26%
Trans/Util	950	927	1,000	909	910	970	2%
Retail/Whsl	3,340	3,572	3,790	4,063	4,460	4,420	32%
Services	2,820	2,555	2,663	2,918	3,320	3,360	19%
Government	3,540	3,660	3,925	4,118	4,330	4,430	25%
Other	570	700	694	741	740	740	30%
Avg. Employmen	14,900	15,061	15,725	16,445	17,680	17,850	20%

Source: Employment Security Department

Clallam County							
Total labor fo	21,290	21,960	22,610	23,050	24,530	24,570	15%
--employment	19,130	19,800	20,430	21,160	22,450	22,840	19%
--unemployment	2,160	2,160	2,180	1,890	2,080	1,730	-20%

Source: Bureau of Labor Statistics

EXHIBIT

TABLE C

ECONOMIC IMPACT OF TRAVEL
REGION 8 OLYMPIC PENINSULA
1987 ESTIMATE*

TRAVEL EXPENDITURES	$ 180 million
TRAVEL-GENERATED PAYROLL	$ 35 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	4,600
STATE TAX RECEIPTS	$ 10 million
LOCAL ROOM TAX	$ 520 thousand

CLALLAN

TRAVEL EXPENDITURES	$ 62 million
TRAVEL-GENERATED PAYROLL	$ 11.7 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	1,620
STATE TAX RECEIPTS	$ 3.6 million
LOCAL ROOM TAX	$ 141 thousand

KITSAP

TRAVEL EXPENDITURES	$ 34 million
TRAVEL-GENERATED PAYROLL	$ 7.8 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	1,020
STATE TAX RECEIPTS	$ 2.1 million
LOCAL ROOM TAX	$ 100 thousand

GRAYS HARBOR

TRAVEL EXPENDITURES	$ 55 million
TRAVEL-GENERATED PAYROLL	$ 10 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	1,250
STATE TAX RECEIPTS	$ 2.4 million
LOCAL ROOM TAX	$ 153 thousand

MASON

TRAVEL EXPENDITURES	$ 14 million
TRAVEL-GENERATED PAYROLL	$ 3.3 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	375
STATE TAX RECEIPTS	$ 750 thousand
LOCAL ROOM TAX	$ 50 thousand

JEFFERSON

TRAVEL EXPENDITURES	$ 14 million
TRAVEL-GENERATED PAYROLL	$ 2.3 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	330
STATE TAX RECEIPTS	$ 700 thousand
LOCAL ROOM TAX	$ 74 thousand

* Compiled from taxation and employment data and adjusted in accordance with the U.S. Travel Data Center model.

8.31/108
April 1989

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TABLE D

ECONOMIC IMPACT OF TRAVEL
OLYMPIC PENINSULA
1989 PRELIMINARY ESTIMATE*

TRAVEL EXPENDITURES	$ 192 million
TRAVEL-GENERATED PAYROLL	$ 37 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	4,690
STATE TAX RECEIPTS	$ 10.2 million
LOCAL ROOM TAX	$ 947 thousand

CLALLAM

TRAVEL EXPENDITURES	$ 68 million
TRAVEL-GENERATED PAYROLL	$ 12.2 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	1,660
STATE TAX RECEIPTS	$ 4 million
LOCAL ROOM TAX	$ 239 thousand

KITSAP

TRAVEL EXPENDITURES	$ 36 million
TRAVEL-GENERATED PAYROLL	$ 9 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	1,040
STATE TAX RECEIPTS	$ 2.1 million
LOCAL ROOM TAX	$ 137 thousand

GRAYS HARBOR

TRAVEL EXPENDITURES	$ 57.1 million
TRAVEL-GENERATED PAYROLL	$ 10.1 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	1,265
STATE TAX RECEIPTS	$ 2.6 million
LOCAL ROOM TAX	$ 330 thousand

MASON

TRAVEL EXPENDITURES	$ 14 million
TRAVEL-GENERATED PAYROLL	$ 3.4 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	375
STATE TAX RECEIPTS	$ 760 thousand
LOCAL ROOM TAX	$ 44 thousand

JEFFERSON

TRAVEL EXPENDITURES	$ 16.5 million
TRAVEL-GENERATED PAYROLL	$ 2.5 million
TRAVEL-GENERATED EMPLOYMENT (FTE)	350
STATE TAX RECEIPTS	$ 800 thousand
LOCAL ROOM TAX	$ 197 thousand

* Compiled from taxation and employment data and adjusted in accordance with the U.S. Travel Data Center model.

8.31/119
July 1990

EXHIBIT

TABLE E

PERSONAL INCOME BY SOURCE

CLALLAM COUNTY	1980	1985	1986	1987	1988	%CHG 80-88
Source(000$)						
Earnings	$286,035	$342,107	$364,389	$372,700	$395,302	38.2%
Investments	$105,209	$178,804	$189,194	$197,745	$214,825	104.2%
Transfer	$95,077	$155,753	$163,355	$177,465	$182,514	92.0%
Total	$486,321	$676,664	$716,938	$747,910	$792,641	63.0%
Per Capita($)	$9,402	$12,713	$12,989	$13,514	$14,142	50.4%
% of WA	87.66%	90.32%	87.97%	87.27%	85.88%	

JEFFERSON COUNTY	1980	1985	1986	1987	1988	%CHG 80-88
Source(000$)						
Earnings				$110,848	$135,139	
Investments				$75,212	$79,725	
Transfer				$61,606	$63,980	
Total	$156,000	$227,000	$246,000	$261,000	$278,844	42.0%
Per Capita($)	$9,699	$12,703	$13,237	$13,721	$14,330	47.7%
% of WA	90.4%	90.7%	89.2%	87.3%	87.0%	

TABLE F

MEDIAN HOUSEHOLD INCOME* NORTH OLYMPIC PENINSULA

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
CLALLAM COUNTY	$16,890	$17,300	$17,750	$17,900	$18,500	$19,750	$20,300	$21,000	$21,250	$22,000
JEFFERSON COUNTY	$15,353	$16,500	$17,300	$17,600	$17,900	$19,200	$19,500	$19,900	$20,600	$21,250
WASHINGTON STATE	$18,367	$20,600	$22,300	$23,000	$23,500	$24,750	$25,700	$26,850	$27,600	$28,800
REAL $ (1982)										
DEFLATOR	.782	.866	.946	1	1.041	1.08	1.116	1.144	1.198	1.245
CLALLAM COUNTY	$21,598	$19,977	$18,763	$17,900	$17,771	$18,287	$18,190	$18,357	$17,738	$18,364
JEFFERSON COUNTY	$19,633	$19,053	$18,288	$17,600	$17,195	$17,778	$17,473	$17,395	$17,195	$17,738
WASHINGTON STATE	$23,487	$23,788	$23,573	$23,000	$22,574	$22,917	$23,029	$23,470	$23,038	$24,040

*Estimated 8/90
Source: Office of Financial Management

COMMENTS OF ELWHA KLALLAM TRIBE

RESPONSES TO ELWHA KLALLAM TRIBE

EVERGREEN LEGAL SERVICES
NATIVE AMERICAN PROJECT
101 YESLER WAY, SUITE 301
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ADA SHEN-JAFFE
DIRECTOR

(206) 464-0838
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June 27, 1991

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, D.C. 20426

Re: Project Nos. 588 and 2683

Comments of the Elwha Klallam Tribe on the Draft Environmental Impact Statement

Dear Ms. Cashell:

Please accept and place in the administrative record the following comments on the Draft Environmental Impact Statement published by the Commission in February, 1991.

GENERAL COMMENTS

The Tribe has been given an opportunity to comment on a draft decision document addressing the retention or removal of two dams which have long threatened and devalued the Elwha Reservation. Comments on a Draft Environmental Impact Statement are perhaps not the best vehicle for expressing the intensity of feeling and sense of loss which this project has imposed on three generations of Elwha Klallams. The Tribe is the governmental jurisdiction with the most to lose, should the administrative record not thoroughly examine the alternatives. It is also the government which has been unwillingly insuring and subsidizing the "cheap" power produced from the project.

Although they suggest changes in the document, these comments should be taken as generally positive. The reviewers, who are not new to the NEPA process, found the DEIS readable and informative. It compares favorably with other EIS's we have had to review and we appreciate the effort that must have gone into the document. But we do want to make suggestions for further improvements.

ELWHA TRIBE'S DEIS COMMENTS
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COMMENTS OF ELWHA KLALLAM TRIBE

Some major points, although they are discussed throughout the specific comments, should be highlighted here:

EKT-1 1. The Tribe has serious concerns about the balance and accuracy of the economic analysis set out in the DEIS. The cost of replacement power is inflated by using a rather improbable marginal resource instead of those much more likely to be available for new load in the regional grid. The cost of generating power from the dams is underestimated by allowing the Applicant to propose mitigation and enhancement for a limited number of fish species and omitting other costs such as net-benefit annual charges. The impact of the dam retention alternative on the Tribe is discussed, but without providing a more detailed understanding of the cost of further reductions in an economic base that the project has already decimated. No attempt is made to estimate those aspects of non-developmental values for which valuation methodologies do exist. Finally, the cost of delay in removal (increased sediment, inflation, lost genetic values, etc.) ought to be disclosed more fully.

EKT-2 2. The treatment of cultural resources, particularly traditional cultural properties, is inadequate. The decisionmakers and the public ought to be given a better understanding of the importance of properties occupied by the project to the Tribe and the national heritage.

EKT-3 3. We are unable to review and comment on any aspect of FERC computer simulations using the HEC-6 Beta model. We attempted to arrange a meeting with the FERC consultant who performed the HEC-6 analysis in order to come to a better understanding of the DEIS but we were not permitted to do so. The model and the voluminous input and output data were forwarded to us at such a late date that we were unable to review the simulations in the time remaining.

EKT-4 4. The dam removal scenario described in the DEIS does not provide the degree of sediment stabilization attainable using existing technology within realistic cost constraints. The Tribe proposes a higher, but still environmentally and financially acceptable, level of in-reservoir sediment stabilization.

EKT-5 5. Dam safety remains an issue. The Tribe is especially concerned with the risk associated with "great" earthquakes along the edge of the continent. In addition, the Applicant should be required to provide a warning system for sudden releases from the project and proof-of-insurance against downstream damage.

ELWHA TRIBE'S DEIS COMMENTS
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RESPONSES TO ELWHA KLALLAM TRIBE

EKT-1: The basis for estimating the unit value of power foregone has been modified by using the Council's forecasted avoided cost in lieu of the coal plant. The coal gasification plant cost is presented in a sensitivity analysis (Appendix E). The staff believes the cost analysis is sound, given its limitations as described in Section 2.7.2. The staff believes Section 3.9.2 accurately characterizes the current economic base of the tribe, and Section 4.1 properly forecasts effects of dam retention.

EKT-2: Consultation with members of the Lower Elwha Klallam tribe has not produced any evidence that there is traditional cultural use of the project areas that relicensing would affect. Waterman's (1920) ethnographic field research notes identify the Klallam language names of several places along the Elwha River, including the site of human creation in Elwha mythology. This site is located, however, in Lake Aldwell and is therefore not presently a site of traditional cultural practice. Waterman describes it as follows:

"A place in the bed of the river where there are pits or excavations in the rock, containing water.... This is the spot where human beings were created. The pits [illegible] hollows are the places from which dirt was scooped, out of which the human race was formed.

Sometimes people go to these pits to get information about their future life. If a man thrusts his hand into this water, and brings out deer hair, for example, he knows he will be a good hunter."

The name of this site, translated, is "Resembling a basket." Waterman does not describe its location. His list of place names, however, begins at the mouth of the Elwha River, and moves successively upstream. The place listed immediately prior to "Resembling a basket" is a "half mile above the (Elwha dam) power plant." The place listed immediately after the human creation site is the mouth of Indian Creek, which is at the upstream end of Lake Aldwell. The human creation site is thus probably located somewhere between Indian Creek and a half mile above Elwha dam.

Other sites mentioned in Waterman's notes that are located in the reservoir include the Elwha dam site called "Enclosed by a canyon," a place near the power plant named "place where there are holes in the face of the rock," a place further upstream called "mouth of the steep place," a boulder still further upstream named "where one pounds sinew on a rock" (for rope making), a spot one-half mile above the power plant called "where they bathe," and Indian Creek.

COMMENTS OF ELWHA KLALLAM TRIBE

RESPONSES TO ELWHA KLALLAM TRIBE

EKT-2 cont'd Traditional cultural properties gained some legal protection with the National Historic Preservation Act of 1966 and the American Indian Religious Freedom Act of 1978. Lake Aldwell inundated these sites, however, prior to the passage of these laws. The sites might be restored under dam removal alternatives, since the aim of dam removal would be to restore the original channel. It is not certain, however, that these sites could conclusively be identified. Their restoration would not necessarily, therefore, be an effect of dam removal.

Text referring to the human creation site has been modified to be more descriptive. Text has been added to Sections 4.2.9.2 and 4.4.9.2 for alternatives involving Elwha dam removal, to indicate the possibility that the human creation site might be relocated and restored. A statement to this effect has also been added to the impacts summary in Section 5.2.9 and in Section 4.6, Irreversible and Irretrievable Commitment of Resources.

EKT-3: The FEIS uses the final version of the Corps HEC-6 model as one approach to estimating the types of downstream changes that could occur with the dam removal alternatives. The new model input and output files are available upon request.

EKT-4: Additional dredging, a reduction in re-saturation potential, and sediment stabilization measures are addressed in Sections 4.2.1.1 and 4.2.1.3. See also response EKT-188.

EKT-5: The safety of the projects has been established through the mandated safety inspection program for hydropower projects (Sections 2.1.1.3 and 2.1.2.3). Projects are periodically inspected and assessed, and analyses are performed by independent experts. This procedure is uniform for non-governmental hydroelectric projects throughout the country. Regional earthquake conditions applied are those developed through research and approved for the assessment of hydroelectric project safety.

COMMENTS OF ELWHA KLALLAM TRIBE

EKT-6 6. The dam-retention proposal is not consistent with the Treaty of Point no Point, the purposes for which Olympic National Park was created, or the public interest. It will prevent, not facilitate, full restoration of the ecosystem and actually impose unacceptable social and economic costs on the Tribe.

To the extent that they are not inconsistent with these comments, the Tribe incorporates by reference the comments of the other fish and wildlife or environmental intervenors.

SPECIFIC COMMENTS

References are, generally, to sections and full paragraphs within sections. A paragraph reference without the section reference relates back to the preceding section reference. If a section is long, references under the section reference will be to pages and full paragraphs on those pages. Other methods of reference are used as appropriate.

GLOSSARY OF TECHNICAL TERMS

EKT-7 ALLUVIAL CHANNELS: The word "cobble" should be added.

EXECUTIVE SUMMARY

EKT-8 Page xxxiii, ¶ 2, next to last line: There are management techniques available. The line should read "...about the behavior and management of large quantities of sediment ...."

EKT-9 ¶ 3, item 1): The resource objective is "the restoration of all previously existing species of wild, self-sustaining runs of anadromous fish."

EKT-10 Page xxxiv, ¶ 2: The Tribe questions whether the present chinook and coho runs are "relatively large."

EKT-11 ¶ 4: It is stated here that steelhead have an excellent chance of restoration with the applicants proposal. This is in conflict with the information presented in Table 5-3 which shows only a good chance of restoring winter steelhead.

EKT-12 Page xxxv, last ¶: "sediment stabilization" is perhaps the wrong phrase; rather the streamflow and loads will come "into balance" or equilibrium and be "at-grade" again.

EKT-13 Page xxxvi, ¶ 2: The comment is made that dam removal "would cause relatively severe impacts to aquatic resources during"

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RESPONSES TO ELWHA KLALLAM TRIBE

EKT-6: Comment noted.

EKT-7: The text has been changed in the Glossary of Technical Terms.

EKT-8: Comment noted.

EKT-9: None of the resource objectives are stated in terms of optimal levels of achievement. Nonetheless, all alternatives evaluated in the EIS are assessed with regard to the outlook for restoring as many as possible of all previously existing species.

EKT-10: The text has been changed in the Executive Summary. The stocks are larger than any other coho, chinook, or steelhead stocks on the Strait of Juan de Fuca; however, the staff agrees many other Puget Sound and coastal stocks are larger, so the statement has been changed to "moderate."

EKT-11: The text has been changed in the Executive Summary.

EKT-12: Comment noted.

EKT-13: More explanation has been included in Section 4.2.3.1. Additional text changes are not needed.

COMMENTS OF ELWHA KLALLAM TRIBE

EKT-13 cont'd construction and shortly thereafter. The information presented in the body of the DEIS does not support this conclusion. Vague references are made to unquantified "adverse impacts", yet the DEIS also states that no direct mortality is expected due to dam removal (page 4-94).

EKT-14 ¶ 3: Depending on the stages and season of dam removal, some steps could be taken to accelerate anadromous fish restoration.

EKT-15 Page xxxvi, last ¶: The "competitive advantage" to the mill has come at a considerable cost to the Tribe, the fishery, and the environment. It is not free. The questions must be asked, "Is a private business which succeeds only because its operating costs are passed on to the public actually a viable entity? Does this business have an unfair edge over its competitors?" In addition, it appears that Daishowa will lose its "cost advantage" even with the dams in place, and may actually experience a "cost disadvantage."

EKT-16 Page xxxvii, ¶ 4: Glines removal poses a safety hazard at Elwha because of the accumulation of sediments having a significantly higher mass against the upstream face of Elwha Dam. In addition, it will prevent beach restoration and restoration of chum and pink runs.

1.0 PURPOSE AND NEED FOR ACTION

EKT-17 § 1.4, ¶ 1: The Lower Elwha Tribe and its cultural and economic resources need to be specifically included in the list of public interests at stake.

EKT-18 ¶ 2: A fourth resource objective should be restoration and protection of the cultural resources of the basin. The Tribe also questions the assumption that "tradeoffs" are legally acceptable when they involve violation of federal treaty rights and the assumption that a "balance" between natural resources and marginal hydropower can be "appropriate" on this particular river.

EKT-19 § 1.4.1, ¶ 1: The fisheries objective is the restoration of all, not some, anadromous species in the river.

EKT-20 1-6, ¶ 2: The Lower Elwha Tribe must be included as a management agency equally responsible with the State of Washington for harvest and habitat management.

EKT-21 § 1.4.3.1, 1-8 to 9: "Reliability" speaks to "the age and condition of existing resources, and system reliability criteria". The "NPPC" power system should be public, and tied into BPA, for system efficiency and economies, rather than allowing a remnant power source which provides only a small portion of the load to one

ELWHA TRIBE'S DEIS COMMENTS
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RESPONSES TO ELWHA KLALLAM TRIBE

EKT-14: The text has been changed in the Executive Summary.

EKT-15: Comments noted.

EKT-16: Originally placed materials at the Elwha Dam extend far up the dam face. It is unlikely that significant additional accumulations would occur because the invert of the power intake is currently below the elevation of the placed materials. Sediment conveyed to Lake Aldwell and toward the dam would follow the gradient to the power intake and ultimately be discharged through the hydroelectric plant. Equilibrium conditions would ultimately result whereby sediment discharged from Lake Aldwell would equal that entering the reservoir.

EKT-17: The listing contained in Section 1.4 is a generic listing based on the Federal Power Act. The importance of the Lower Elwha Tribe and its cultural and economic resources are emphasized in the EIS.

EKT-18: The three resource objectives presented in the EIS were an outgrowth of a fully documented EIS scoping process. Cultural resource restoration and protection did not emerge as a principal objective. As with the many other important resource issues, however, the effects of the alternatives on cultural resources are addressed in Section 4.0.

EKT-19: Refer to response EKT-9.

EKT-20: The text has been changed in Section 1.4.1.

EKT-21: Comment noted.

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EKT-21 cont'd

industry, not to the Port Angeles community, drive the decision-making process with respect to resources of regional, state wide, national and worldwide significance (the Elwha River; its fisheries, wildlife and forest resource; and the Olympic National Park). The benefits of saving the existing system, with tack-on devices to try to minimize or offset impacts, are minuscule by comparison to long-term social benefits of returning the Elwha River system to its natural productivity.

2.0 PROPOSED ACTION AND ALTERNATIVES

EKT-22

§§ 2.1.1.3 and 2.1.2.3, 2-5 to 2-10: It should be made clear that both structures have been strengthened to resist the overturning moment predicted from overtopping by a predicted probable maximum flood. The foundation under the strengthened Elwha structure continues to be made up of sedimentary materials, not bedrock. These are the same materials that blew out during reservoir filling, an event well-remembered within the Tribe. There has not been any scientific evaluation, to the Tribe's knowledge, of the structural integrity of the jury-rigged fill used to seal the void created by the blowout. Whether that portion of the project is safe cannot be predicted with certainty. It consists, in part, of organic materials which may have deteriorated over the years. Was an evaluation done of the ability of the foundation to withstand the accelerations expected during a seismic event?

It appears from a later section that the structures were evaluated postulating an earthquake of 7.5 on the Richter Scale. But it is not clear what attenuation factor was used in computing accelerations; what the accelerations were; and whether multiple-fault events involving overtopping, liquefaction of sediments, and mass failures into the reservoirs were simulated.

The assumption that no earthquake greater than 7.5 will occur is also questionable. A recent publication (Savage and Lisowski, 1991) has identified the possibility of a "great" quake (much greater than 7.5) off the coast of Washington. We urge that FERC review this document and work conducted by Brian Atwater (USGS at the University of Washington Geology department) when evaluating the geology of the region. While the frequency of occurrence may be numerically lower than a 7.5 event, the risk is considerable because of the magnitude of harm which would follow from single or multiple failures. The Tribe computed the bore wave from the failure of about the top 35 feet of Elwha Dam in the late 1970's. That was bad enough without including deeper and/or multiple failures from severe shaking and mass failures in the reservoirs.

The high hazard potential of the two dams has had significant economic and social impacts on the Lower Elwha Tribe because its

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EKT-22: The staff recognizes the Tribes' fears, but maintains that the dams are now safe. Refer also to response EKT-5.

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EKT-22 cont'd

reservation is located in the flood plain below the dams. Prior to post-tensioning of the Elwha main dam structure and construction of the dike protecting the reservation, the Tribe was forced to purchase land away from the reservation to supply housing for tribal members. Also, the fear of dam failure is always in tribal members minds; elders remember the original failure of the Elwha Dam. **The Commission must be fully aware of the continuing fear by tribal members that one or both of the dams are unsafe and will fail under conditions which have a reasonable likelihood of occurring. They have had assurances of safety before, in the period before the blowout and in the 1970's; those assurances proved to be wrong.**

EKT-23

One condition of any license, including annual licenses, should be provision for indemnity sufficient to compensate for loss of life, property and natural resources, along with other legal damages, should one or more dams fail. The cost of such insurance should be reported and included in economic evaluations. Proof of insurance should be provided to the Tribe and the Bureau of Indian affairs. The Tribe and the Secretary of the Interior should be listed as named insureds.

EKT-24

§ 2.1.2.2, ¶ 2: Is Lake Aldwell held within 1-foot of its normal water surface level on an average (daily, weekly, monthly?) basis or is this at all times? That is, is there data which shows that the reservoir is or is not used for peaking over the course of 24 hours? The project is definitely not operated under a run-of-the-river regime on the rising hydrograph of flood events. Sudden releases of water, without adequate warning, are chronic. In any event, it is inaccurate to describe the project as run-of-the-river. Glines is and will be operated in a storage-and-release mode; Elwha follows Glines.

EKT-25

§ 2.2 generally: The Applicant's proposal, even with modifications suggested by Staff, is incomplete. It would attempt only partial restoration of a few anadromous species. The Applicant and the Commission are legally obligated, under the Treaty of Point No Point, the Federal Trust Responsibility, and other applicable law, to provide protection, mitigation and enhancement for all species at levels equal-to or greater-than the production that would occur in the absence of the dams. Until this is corrected, cost figures for dam retention remain artificially low.

There are numerous aspects OF the Applicant's proposal to which the Tribe objects, primarily focused on the fact that it will not result in the restoration of all anadromous fish species, as has been correctly pointed out in the document.

EKT-26

¶ 4: What does it mean physically "to minimize turbulence"? How does it protect out-migrating juveniles? They will be as high

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RESPONSES TO ELWHA KLALLAM TRIBE

EKT-23: The Commission does not require such indemnification of licensees. These projects do not constitute special situations necessitating unusual insurance conditions.

EKT-24: The information provided by the applicant implies that Lake Aldwell is held within 1 foot of its normal water surface elevation at all times. Sudden releases of water observed by the Tribe at Elwha dam might result from spill events, which occur suddenly when compared to the more slowly rising discharges during flood events. Also, these sudden releases of water could result from rapid spilling at the Glines Canyon dam. The staff recognizes that although Elwha dam is operated as run-of-river, flow patterns at this location are largely influenced by releases from Glines Canyon dam and cannot be considered to follow a natural flow regime.

EKT-25: The staff notes the tribe's contention that the Commission has a treaty obligation to provide for restoration of all species at levels equal to, or greater than, the production levels that would occur in the absence of the dams. Legal questions relating to treaty rights are noted in the EIS, but the EIS is not the vehicle for resolution of those issues.

EKT-26: Turbulence, caused by rough surfaces, increases the chance for fish to contact other rough surfaces as they pass through the area. Reducing turbulence, therefore, reduces the chance for additional scale loss and injury as fish pass through the opening. It does not matter where the fish are initially in the water column; reduced turbulence helps the fish.

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in the water column as possible, unless the gate is just open a foot or two.

EKT-27 § 2.2.1.2, ¶¶ 1 and 3: Because of the importance of the fishery and the marginal prospects for the Applicants facilities, intensive evaluation by the Applicant and the fisheries agencies should be funded by the Applicant and carried-out over the life of the project. The same is true of the broodstock and hatchery program.

EKT-28 ¶ 2: The natural regime would have to be defined and current operations changed to achieve even an approximation of "a run-of-the-river mode."

EKT-29 § 2.2.2.2: The schedule for increased flows to permit fish passage must be reexamined. The plan suggests increased flows of 100 cfs from 9 pm to 5 am between April 16-Nov 15. This does not accommodate fish migrating during daylight hours or fish migrating later in the season. Preliminary information indicates that residual fish that migrate late in the year may be the most successful spawners and are particularly important for restoration of anadromous salmonids. We also question the adequacy of 100 cfs releases.

EKT-30 2-14, Table 2-4: What are the reasons for different sunrise and sunset intervals in different seasons? How do they tie to fish migration in the Lower and Middle River?

EKT-31 § 2.2.2.2, 2-14, ¶ 2: During 1987-89, when the Applicant augmented flows, only in 1989 did the low flows rise above the yearly natural, pre-dam balance of annual low, average and high daily flows.

EKT-32 § 2.2.4, ¶ 2: The DEIS should include annual charges for the use of United States land to generate power. Will annual charges be assessed? If so, what valuation formula will be used?

EKT-33 §§ 2.3.1 and 2.3.2, generally: The Tribe agrees with the overall approach to dam removal and sediment management. But we question whether the use of "terraces" without additional safeguards constitutes "stabilization of reservoir sediments to the extent possible" and we would suggest removing more fine materials from the river channel. An engineering investigation carried out by the Tribe (Summit Technology, Dr. Fred Watts, R.W. Beck and Associates) examined four approaches to controlling sediment release under the dam removal alternative. The approach presented in these sections has features similar to our scenarios 2 and 3. We agree in general that the FERC approach may be a workable solution to the problem of sediment management.

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EKT-27: This is a description of the applicant's proposal, not an evaluation. However, the staff recommendations include post-operational studies (see Section 4.1.3.3).

EKT-28: Refer to response EKT-24.

EKT-29: This is a description of the applicant's proposal, not an assessment For the staff recommended additional flow and duration, see Section 4.1.3.3.

EKT-30: The ramping rates and times are from other western Washington stream studies. These are the rates that have been recommended in past meetings by the JFWA as acceptable without site-specific studies.

EKT-31: The applicant's proposal as stated can be directed by the agencies to augment flow in late summer. This can increase lowest flows, if so directed by the agencies.

EKT-32: Annual charges are of a magnitude (i.e., less than $3,000 for the Glines Canyon Project in 1991) that their inclusion in the analysis would be pointless. Annual charges are based on separate assessments for lands and for administrative costs.

EKT-33: Comment noted. See responses EKT-4 and EKT-188.

EKT-33 cont'd

Our scenario 1 is more conservative, providing a higher degree of protection for what we believe is an acceptable cost. It offers more controlled sediment release than the FERC approach and, we believe, a more predictable construction process. The primary difference is the removal and storage of sediments behind erosion control berms, rather than simply terracing materials. The streamside embankment would be rip-rapped to protect against failure during severe flooding. A description of our approach and a comparison of techniques and estimated costs is included in our comments on Appendix A.

EKT-34

§ 2.3.2, P 4: The DEIS proposes to supplement the Glines Canyon Dam diversion tunnel with a 1,000 cfs capacity diversion canal. The canal would originate at the upstream end of Lake Mills, extend around the western edge of the lake and terminate at the existing power intake. There, water would be released into the existing power tunnel and exit through the powerhouse. The primary advantage of the diversion canal would be to add relatively high quality water to the more turbid diversion tunnel releases. The combined mix would be better from an overall water quality standpoint. However, we suggest that the selective withdrawal capability of our "shaft" lake tap alternative would eliminate the need for a diversion canal. Employment of silt screens would also help improve water quality of diversion discharges. A diversion canal would leave a scar on the hillside, would be very difficult to construct, would leak extensively unless lined with a geomembrane, and would interfere with construction unless bridges were provided across it to access sediment removal operations.

EKT-35

§ 2.3.3, ¶ 1: The Tribe would use a shorter decommissioning schedule to reduce construction impacts further.

EKT-36

§ 2.7.2, generally: The DEIS asserts that the opportunity cost to the region from decommissioning of Glines and Elwha dams is equal to the cost of "replacement power," based on the region's "long-term marginal resource." The DEIS goes on to assume, based on an examination of work by the Northwest Power Planning Council (NPPC), that thermal coal-based power production, estimated to cost 9.6 cents/kWh in 1996 dollars, is the appropriate "long term marginal resource" to reference for opportunity cost calculations. On this basis, and after adjustment for startup years, the DEIS estimates the opportunity cost of lost generation to be $164 million dollars, expressed as a present value in 1996 dollars.

This analysis incorporates three substantial errors.

First, it relies on the cost of an hypothetical "long-term marginal resource." Economic theory clearly states that marginal cost is the cost of the "next" unit acquired, not the (higher) cost of some later acquisition purchased in the longer term. This fundamental principle is embedded in the standard operating

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EKT-34: Because of the described considerations and other uncertainties, the diversion canal concept has been dropped. Assuming a tunnel diversion as proposed was the ultimately selected method of diversion and drawdown, other means including a selective withdrawal shaft would be considered and evaluated. In the revised alternative (Section 2.3.2), dam removal would proceed during drawdown phases.

This would allow less turbid waters from the surface to pass over the dam if downstream turbidity were excessive. In the event of a flood, this scheme would also prevent resaturation of stabilized sediment due to increasing reservoir water levels from excess accumulation.

EKT-35: A revised schedule having a shorter construction duration has been incorporated into the EIS (Section 2.3.4).

EKT-36: The basis for estimating the value of power foregone has been modified. Refer to response EKT-1. The use of nominal dollars is standard FERC procedure, and the staff notes that the Northwest Power Planning Council has switched from real to nominal cost analysis.

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procedures of virtually every agency doing project economic evaluation. Further, development of new power resources is characteristically prioritized in order of lowest cost, subject only to practical constraints in the actual operating power system (NPPC, 1991 draft Northwest Conservation and Electric Power Plan, Volume II, Group 6, (NCEPP 91)).

The procedure used in the DEIS, by its own internal logic, would be expected to lead to establishment of something approaching a "highest marginal cost benchmark" based on potential acquisition of resources by the region at a longer-term future date, not on "lowest alternative cost", required by standard economic procedure.

If this "highest marginal cost" approach were applied to a succession of projects, the sum of the projected acquisition costs would be expected to greatly exceed the region's actual acquisition costs over any given period of power system buildout, as less expensive available production capability was brought on line first. In NCEPP 91, out of 37 sources of additional power capability that are identified, 22 are judged to cost less than Eastern Montana Coal, while 27 are judged to cost less than coal production from Western Washington/Oregon.

EKT-36 con't'd

In addition, in NCEPP 91 NPPC reports "[T]here are major uncertainties regarding the region's ability ... to site and construct significant amounts of new coal-fired resources." This judgement is confirmed in examination of BPA's recent Billing Credit Solicitation(1990), where it does not include thermal coal among six alternative resource groupings which, in the words of the solicitation, are "potentially cost-effective resources available for acquisition"

A further consideration tending to support a lower range power acquisition cost is that, at the discount rate employed in the DEIS, the importance afforded future costs falls to approximately 25 cents on the dollar in project year 13, and continues to decline to negligible levels thereafter. As far as the present value calculation in the DEIS is concerned, long term marginal costs are irrelevant.

Additionally, we note that working in levelized nominal costs, as in the DEIS, is unusual. Economists and power analysts normally work in real costs. According to BPA (1990), real levelized alternative costs in the Northwest Power system stand at 3.6 cents per Kwh or lower, in 1990 dollars.

EKT-37

§ 2.7.3, generally: The second major error occurs when the "highest marginal cost" approach is applied. The opportunity cost of decommissioning is overstated. The Tribe (using an economic consultant) computed the actual cost. Following standard economic procedure, and depending on data in NCEPP 91, two approaches to

EKT-37: The staff has adopted the Council's estimated regional avoided cost for a generating resource with a 30-year physical life. The levelized cost is 6.7 cents per kWh.

EKT-37 cont'd

computation of that cost present themselves:

1. Using a strict least alternative cost procedure for selection of replacement power capability, what replacement resource would be selected in the region in 1998/99, and at what cost?

2. Assuming power replacement cost to equal the weighted average of all new acquisitions of power capability by the region in 1998/99, what average replacement cost would result?

The year 1998/99 was selected as the marginal power replacement date in an attempt to conform to what we understand the timing of full power replacement in the DEIS to be. Cost estimates are expressed in 1996 dollars, again in an attempt to conform to our understanding of the basing year for estimates in the DEIS. We understand the DEIS to work on the basis of nominal levelized cost. We have done the same, working from NCEPP 91. NPPC costs were almost all estimated in 1988 dollars. We updated them to a 1996 equivalent, using an arbitrary escalator of 2 percent per year for non-structural energy sources, and 5 percent for structural sources. Finally, we referenced the NCEPP 91 scenario for net power capability additions in 1998/99 to meet medium load growth, contained in Appendix 10-A of that document.

This scenario represents potential regional response to the median growth projection considered by NPPC. We note that the DEIS analysis was based on an earlier "medium-high" load growth estimate for the region, but made no analysis of any counter-balancing "medium-low" load growth projection. While detailed modelling will undoubtedly modify the numbers presented below, we are confident that these estimates are sufficiently accurate to validate the substantive conclusions we reach.

If a strict least economic cost replacement criterion is applied for power lost from removal of Glines and Elwha dams, and referencing the NPPC scenario for meeting load growth in 1988/89, the region would replace this power via conservation initiatives relating to voltage regulation. NPPC estimates the 1988 levelized nominal cost of such an initiative at 1.34 cents/Kwh. Updating to 1996, using a two percent escalator, this would imply a 1996 nominal levelized cost of approximately 1.57 cents/Kwh. At that point in time, the Region would also have 21 other generic sources of energy capability that were cheaper than coal-fired thermal.

NPPC points out that while it follows an overall least cost policy for future acquisition of power capability, practical circumstances affecting the power system and the needs of its customers will constrain this policy to some extent. Consequently, the power acquisition scenarios it develops, while generally

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EKT-37 cont'd

reflecting a least cost approach, display acquisition of an array of generating sources in each time period. To reflect this "constrained least cost perspective", we returned to NPPC's medium load growth rate scenario and calculated the weighted cost per Kwh of all scenario additions to power capability in the 1998/99 year. These calculations resulted in a weighted system-wide power replacement cost of 4.51 cents/kWh in 1988 dollars. Updating annual cost of non-structural acquisitions (65.6% of total) by 2 percent, and cost of structural acquisitions (34.4% of total) by 5 percent per year, results in an equivalent power acquisition cost estimate of 5.85 cents/kWh in 1996 dollars.

These estimates likely bound the range of gross marginal cost facing the region with respect to removal of Glines and Elwha dams. For relatively small perturbations of regional power capability, such as that associated with the Glines/Elwha decision, regional response would tend to follow the stricter least cost approach. For broader issues affecting power supply capability, adjustments at the full power capability portfolio level would be more likely, using the average replacement cost approach.

EKT-38

The third major error in this section is the failure to subtract the power cost savings if Glines and Elwha are decommissioned. The DEIS correctly identifies the focus for power calculations as replacement of power from Glines and Elwha dams by power from other sources. But it must compute the net cost, reducing it by expenditures no longer required. If the dams are considered part of the regional power supply, this savings to the region must be disclosed.

Thus, the DEIS estimates the cost of the Region going out and buying coal-fired thermal generating capability, but forgets to credit system power costs "replaced" by this initiative. We understand the cost of power from the Glines/Elwha complex to be presently estimated at 3.9 cents/kWh[1] under the Applicant's dam retention plan. Using this estimate, and those we have developed in previous paragraphs, we are now in a position to properly calculate the net economic impact upon Regional power acquisition costs from removal of Glines and Elwha dams in 1996 dollars:

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[1] The 3.9 rate computed for the DEIS does not include costs for protection, mitigation and enhancement of, or compensation for, the anadromous fish species which the Applicant does not propose to bypass around the dams or the lost production in the species the Applicant does intend to mitigate for. Nor does this rate appear to include annual charges to the United States for the power value of the federal land used for power generation.

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EKT-38: The notion that the EIS cost analysis has failed to consider the power cost savings if the projects are decommissioned is incorrect. The cost savings associated with no longer operating and maintaining the hydroelectric projects if they are removed have been accounted for in the operation and maintenance (O&M) cost portion of the calculation (refer to the "baseline operation and maintenance" line item in Tables 2-7 and 2-9). Specifically, the discounted capital and O&M cost for the dam removal alternative ($125 million from Table 2-14) accounts for the O&M savings that would occur if the dams no longer existed. This point is also made in Table 2-15.

EKT-38 cont'd

	1. LEAST COST REPLACEMENT	2. CONSTRAINED LEAST COST REPLACEMENT
Cost per kWh for replacement power	1.57 cents	5.85 cents
Saving per kWh from not operating Glines and Elwha Dams	3.90 cents	3.90 cents
Net regional benefit or <cost> per kWh from not operating Glines and Elwha Dams	2.33 cents	<1.95 cents>
Adjusted total net benefit (+) or cost (-) to the regional power production system from removal of Glines and Elwha Dams*	+$39.9 million	-$33.4 million

*These estimates are obtained by adjusting the DEIS present value of loss figure of $164.2 million by the ratio of net power costs per kWh determined in this Table to the estimate of 9.6 cents per kWh in the DEIS. More detailed calculation would alter these estimates slightly, but not substantively.

Our best estimate is that the regional power system would achieve a net power cost benefit from removal of Glines and Elwha dams. Our alternative scenario suggests that net costs to the regional power production system would only amount to about 20% of those identified in the DEIS.

EKT-39

§ 2.7.2, ¶ 3: The statement "[b]ecause of the absence of generally accepted methodologies, no attempt was made to assign dollar estimates to nondevelopmental values such as fish production ...." ignores a vast guideline literature concerning appropriate socio-economic procedure by the (former) U.S. Water Resources Council, at present under CERCLA (Department of Interior, 1986), and by various fisheries and power agencies in the region (eg. BPA, 1986).

While some values, such as National Park ecosystem restoration and cultural effects on the Tribe, may not lend themselves to

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EKT-39: Sections 2.7.2 and 5.4 have been modified to clarify that the dollar comparison is a cost analysis, not a full economic analysis of benefits and costs. With regard to commercial value of fish production, staff estimates are presented in the Socioeconomics section of Section 4.0.

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EKT-39 com'd quantification, there are methods of computing such things as the sport and commercial value of fish and wildlife. Just the commercial value of fish production, even excluding some species and using a conservation multiplier, is impressive.

3.0 AFFECTED ENVIRONMENT

EKT-40 § 3.1, ¶ 2: The statement is made: "[t]he Elwha flow regime ... is essentially natural due to dam operations that approximate run-of-river conditions". Nowhere in the DEIS is this double-assumption demonstrated. Currently, the applicant may be attempting to operate the dams following "a run-of-river schedule". But, a comparison of Glines Canyon pre- and post-dam average monthly flows shows that: October - December are net storage flows; January is a release month (outflow exceeds inflow); February is a storage month; March - July are release months; and July and August are about even (inflow = outflow). During the highest monthly flows (November - January) the ratios of maximum to minimum regulated monthly flows show that regulated flow variability is 150 to 300 percent of the pre-dam natural flow variability based on the USGS gage at McDonald Bridge. We do not agree that flow below Lake Mills is "essentially natural". In § 2.1.1.2 it is stated that Lake Mills is drawn down up to 10 feet. Elwha follows Glines. This is not run-of-the-river under any definition.

EKT-41 § 3.2.3, ¶ 1 & 2: A recent publication (Savage and Lisowski, 1991) has identified the possibility of a quake far in excess of intensity 7.5 off the coast of Washington. We urge that FERC review this document and work conducted by Brian Atwater when evaluating the geology of the region. We also suggest that the DEIS address the issue of frequency. As presently drafted, it seems to rely on the lack of "evidence of recent fault motion." The first "evidence" might occur too late to prevent dam failure.

EKT-42 § 3.2.6,¶ 1: "Log jams" is a misnomer, because no "logs" with sawed ends can be coming out of the Park. Log jams occur when sawed sections of trees form the dominant material in the jam. These jams in the Elwha River must be large organic debris jams or just tree jams, with branches and root wads attached.

EKT-43 3-10, ¶ 2: In addition to substrate coarsening, downcutting of the channel at the McDonald Bridge USGS gage has occurred since Glines Canyon Dam was installed. If only Elwha Dam is removed, and the base level (Lake Aldwell) is changed to the level of the Elwha Dam falls, then headcutting may take place clear to Glines Canyon Dam, unless there is an intermediate bedrock control to serve as a new base level.

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EKT-40: Comment noted. Sections 4.1.2 and 4.1.2.2 have been revised to state that Glines Canyon Dam does not operate in a run-of-river mode.

EKT-41: Refer to response EKT-5.

EKT-42: The text has been changed in Section 3.2.6.

EKT-43: The bedrock canyon at the McDonald gage may provide bedrock control. With removal of Elwha dam, the channel is likely to erode to a profile similar to the original pre-dam profile.

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EKT-44 § 3.2.12, generally: The Tribe is in substantial agreement with the conclusions here.

EKT-45 3-18, ¶ 5: Various tribal elders remember the reservation beach as sloping more gradually farther into the Strait. What recession is "noticeable" depends upon whether one lives on the shore, perhaps. Storm surges during high tides may be aggravated by the lack of intervening beaches. Winter storm erosion may be getting more severe; the small lake at the end of a former flood channel, according to one local resident (Philips c.1979) is "moving" toward saltwater.

EKT-46 § 3.3.1, ¶ 2: In December and June the mean monthly flows are about 2000 and 2300 cfs, but the higher and lower average monthly flow ranges in these two months are 4713 - 642 cfs in December and 4096 - 1285 cfs in June[2]. The range is much more important in planning and analysis, and the evaluation of sediment transport and natural conditions, than are the average daily flows.

EKT-47 ¶ 3: The largest floods are a result of rain on snow, not due to "extreme precipitation events". The minimum recurrence interval event is 1.01, not 1.0, years, and the scales are not semi-logarithmic as shown in Figure 3-13 on page 3-22. The Water Resources Council federal agency standard is the Log-Pearson Type III extreme event distribution. The bankfull flood with a 2-year return period depends mainly on channel geometry, and in turn the materials through which the flood is forming the channel. Meandering channels overtop the banks at much lower frequency floods. The peak 2-year flood is an instantaneous value, whereas the one-day average 2-year flood of about 7900 cfs represents more closely a bankfull, channel-forming flood. The peak flood means nothing in terms of sediment transport, because it is an instantaneous value. Peak floods are more important for designing for flow capacity of spillways and freeboard. The largest flood in recent years occurred in 1990.

EKT-48 ¶ 4: minimum flows occurred when Glines Canyon Reservoir was being filled in October after maximum drawdown in September, especially in the earlier years of operation (1929 - 1945), not due to drought conditions. Pre-Glines average daily low flows were on the order of 254 - 548 cfs, which included the low average yearly value of 943 cfs in 1926. The only two lower annual flow years up to 1979 were 859 and 873 cfs in 1944 and 1977, respectively.

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[2] Williams, J.R., H.E. Pearson, and J.D. Wilson. 1985. Streamflow statistics and drainage-basin characteristics for the Puget Sound region. Vol. I: Western and Southern Puget Sound. U.S. Geological Survey. Open-File Report 84-144-A. Tacoma, Washington.

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EKT-44: Comment noted.

EKT-45: Comment noted.

EKT-46: The staff concurs that daily flows are much more important than mean monthly flows in planning and analysis. Mean monthly flow statistics were presented for descriptive purposes only in Section 3.3.1. The sediment transport analysis conducted by the staff for the impacts section was based upon daily flow values.

EKT-47: The frequency data points in Table 3-13 represent the annual series of Elwha flood flows. In plotting position, which is the inverse of exceedance probability, the Weibull formula was used. The data are plotted on a semi-log graph rather than fitting it to the Log-Pearson Type III extreme event distribution or any arbitrarily selected distributions.

EKT-48: The staff recognizes that extremely low discharge events occurring before 1945, and described in Section 3.3.1, were a consequence of filling Lake Mills after maximum drawdown. These low-discharge values are not indicative of natural discharge conditions.

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EKT-49 § 3.3.3, ¶¶ 1 & 3: Studies conducted by the Tribe in 1990 indicate that water temperatures in the middle reaches may, at times, actually be lower than natural temperatures in the upper river due to the quantity of water being drawn from depth in Lake Mills for power.

EKT-50 Table 3-4: The magnitudes of total and orthophosphorous, nitrate nitrogen, and ammonia nitrogen are approximately one magnitude higher than those measured by the Tribe's ecological consultant in October, 1990. These differences may be the result of site variations, or may be due to variances in measuring sensitivities, or averages may not adequately reflect ranges which we may have been sampling.

EKT-51 § 3.4, generally: A fisheries life-stage periodicity chart would help the reader.

EKT-52 ¶ 2: The Tribe questions the decision to accord some anadromous species less "measure of treatment."

EKT-53 § 3.4.1, generally: The full range of species provided the Tribe with a constant subsistence base. Given the diversity and size of the fish, access to a varied food supply was unusually convenient.

EKT-54 § 3.4.1.1, 3-28, last ¶: The Tribe strongly believes that there were sockeye in the Elwha River prior to construction of the Elwha Dam. The tribe also does not believe that any of FERC's arguments against sockeye being present are valid. First, the fact that tribal elders did not mention sockeye is not proof that they never existed. It is equally likely that they did not mention sockeye because they were not asked if those fish were present or because any sockeye which had been present became extinct within one brood-cycle. Second, it is true that there are no sockeye on the southern coast of the Strait of Juan de Fuca, but then there are no lakes accessible to sockeye. However, there is at least one sockeye run to the San Juan River on the northern coast of the Strait and the Cheewhat Lake and Nitinat sockeye runs could be considered to be at the mouth of the Strait. Cheewhat Lake is very similar in spawning and rearing area to Lake Sutherland.

EKT-55 3-29, ¶ 4: There is not sufficient data to support the upstream limit of pink and chum salmon.

EKT-56 § 3.4.2.1, ¶ 2: Much has been made in the various documents associated with the Elwha River that the river's lack of a significant estuary makes it a poor chum producer. However, chum egg takes at the original Elwha River Hatchery were as high as 4,000,000 eggs (Hosey, 1988). Assuming a 1-to-1 male/female ratio and 2,000 eggs/female, one finds that there were at least 4,000 chum taken to obtain this number of eggs. This was undoubtedly

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EKT-49: The staff agrees with this statement. Intake waters for the Glines Canyon dam hydroelectric facility are obtained at a depth of 90 feet in the reservoir. The temperature of water released from the powerhouse is often lower than natural temperatures because the entrainment of cool hypolimnetic waters by project intakes. This is particularly true in mid-summer. The DEIS emphasizes the warmer than natural temperatures, which occur in the late summer and early fall due to heat storage by the reservoirs because these warmer conditions have a much greater impact on anadromous fish.

EKT-50: Values for nutrients in most lakes normally vary in response to seasonal fluctuations in primary productivity and vertical mixing of the water column. The low values measured by the Tribe's consultant might have resulted from seasonal variation in primary production, or from differences in depths of the water column sampled. Nevertheless, the nutrient values still confirm the staff's conclusion that Lake Mills and Lake Aldwell are largely oligotrophic (i.e., low primary production).

EKT-51: The staff does not believe this chart is necessary.

EKT-52: Comment noted.

EKT-53: Comment noted.

EKT-54: Comment noted. See responses DOI-53 and DOI-154.

EKT-55: The text has been changed in Section 3.4.1.1.

EKT-56: This section discusses only current production, not historical production.

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EKT-56 cont'd

just a small portion of the total run-size in those years. It should be recognized as well that these large egg-takes were several years after the Elwha dam was in place (1920-21), so it is likely that the dam had already affected the river's production.

EKT-57

§ 3.4.2.3: Tribal elders recall the presence of shellfish on reservation beaches. The cause of their current scarcity may well be the lack of suitable substrate at suitable slopes and elevations as the result of gravel starvation, and the lack of normal nutrient transport out of the river system. The quantity lost on the reservation and at Ediz Hook is not considered "insignificant" by the Tribe. Shellfish in those areas would be more accessible and would fill out the yearly round of cultural activities on the reservation. The statement that shellfish are found "in abundance" elsewhere is misleading: they are often not accessible or are contaminated by fecal pollution.

EKT-58

¶ 2: There needs to be further investigation into the status and potential of sub-tidal areas of the Strait for shellfish production. Freshwater Bay was once a significant producer of all shellfish species. The Elwha River estuary and adjoining areas were capable of producing large numbers of shellfish.

EKT-59

§ 3.4.3.1, ¶ 1: It is not proper for the DEIS to declare that there are no indigenous spring chinook remaining in the Elwha River when the agencies with management and regulatory authority of the fisheries are not in agreement on the matter. In addition, we believe that there has been very little, if any, genetic dilution of the remaining spring chinook from hatchery plants. First, Hosey and Associates (1988) have only identified two plantings of spring chinook. Second, the PFMC tag recovery database shows that only one tag was ever recovered from the 1973 brood-year Dungeness Spring release. It is highly unlikely that a significant number of these fish survived to spawn in the Elwha.

EKT-60

¶ 4: The Tribe has been rearing and releasing chinook sub-yearlings.

EKT-61

¶ 6: The chinook fishery in the Elwha River is still restricted. A test fishery has been conducted for the past 3 years and will be conducted again in 1991. However, a test-fishery is not a commercial fishery. It is used for gathering technical information on run timing and gear selectivity only. Fish harvested in a test fishery are not figured into any allocation agreements or quotas. At this time, no commercial harvests past this four year test fishery program are being discussed. Therefore, FERC should not make any assumptions concerning availability of chinook for future in-river Tribal fisheries. The Tribe does not carry out an in-river harvest of Chinook; a test fishery is not considered a harvest.

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EKT-57: Some text changes have been made in Section 3.4.2.3. However, this section refers to current production, not historical production.

EKT-58: Comment noted. Investigating subtidal shellfish populations of the Strait of Juan de Fuca is beyond the scope of this analysis.

EKT-59: The text has been changed in Section 3.4.3.1. See response NMFS-21.

EKT-60: This section does not state from where fish are released. However, including tribal release numbers would not change the general statements made about numbers annually released.

EKT-61: The text has been changed in Section 3.4.3.1 to reflect this comment.

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EKT-62 3-33, ¶ 2: The high density of redds in the Lower Elwha River is probably the result of hatchery escapee's spawning naturally (as was correctly mentioned earlier in § 3) and should not be construed to indicate availability of gravel. Many of these fish may be spawning in unsuitable areas because of unnaturally high fish densities in a confined location.

EKT-63 § 3.4.4, ¶ 2: The slough at the mouth of the Elwha River is accessible to coho and is utilized for juvenile rearing. Preliminary data shows that Lower Elwha Hatchery coho fry planted in the slough in the spring of 1990 had growth rates comparable to or greater than those achieved at the hatchery. Native pink, chum, and chinook fry were also found to be using the slough for rearing.

EKT-64 § 3.4.6, ¶ 3: The estuary was more extensive and complex prior to construction of the dams.

EKT-65 § 3.4.8, 3-43, bottom: "River size" and "gradient" are general terms. What gradients and size were used?

EKT-66 3-44, ¶ 3: The statement "[t]here is no shortage of steelhead spawning habitat..." is relative; compared to what? Was a limiting factor analysis done? "Steelhead spawning area is in good supply" might be a relatively better way to state this.

EKT-67 § 3.4.9: There may be evidence proving that the rainbow trout above the two dams are actually the residual remnants of the original steelhead population.

EKT-68 § 3.4.13, ¶ 1: PSP is not the only limiting factor. The size and suitability of the estuary have been reduced by the two dams.

EKT-69 § 3.6.4, ¶ 1: Included in this section (or perhaps in the State Plan section) should be the Puget Sound Salmon Management Plan, which has been filed in the Federal District Court. The Strait of Juan de Fuca Regional Plan, which is part of the Puget Sound plan and is currently in draft form, should also be included. The U.S. Canada Salmon Treaty also deserves mention in this section as Elwha chinook and coho are indicator species for the Treaty. Finally, the Treaty of Point No Point and U.S. v. Washington are pertinent to the evaluation of impacts on the Lower Elwha Tribe.

EKT-70 3-80, ¶ 1: The Lower Elwha Tribe is currently drafting a Coastal Zone Management Plan for on-reservation coastal areas.

EKT-71 3.7.2, 3-83, ¶ 4: The Lower Elwha Tribe is responsible for management of recreational resources on-reservation. Also, it has not yet been established what role the Tribe will play in management of hunting off-reservation.

EKT-72 § 3.8.5: Are the middle and lower reaches of the Elwha River true, free meandering channels, or are they "controlled" or "forced

RESPONSES TO ELWHA KLALLAM TRIBE

EKT-62: The text has been changed in Section 3.4.3.1. See response DOI-60.

EKT-63: Comment noted.

EKT-64: This statement refers to the current estuary.

EKT-65: Gibbons et al. (1985) describes the rivers in the model. Generally, all mainstem rivers in western Washington and on the Washington coast were considered the same (e.g., Nooksack, Hoh, Snohomish, and Quinault). The slope categories were also defined in this report (e.g., Zone 1 = 0.25 percent slope, Zone 2 = 0.25 to 0.50 percent, etc.) with each river divided into seven zones. Each zone had different parr density. This parr density was related through modeling of existing systems into maximum sustainable yield escapement for steelhead.

EKT-66: See text changes in Section 3.4.3.6.

EKT-67: Comment noted.

EKT-68: The next paragraph discusses substrate. This section discusses current production, not past considerations.

EKT-69: The Puget Sound Salmon Management Plan does not address the Elwha Basin specifically, and the staff believes it does not address enough of the specific areas that are directly relevant to the projects considered in the EIS. The Treaty of Point No Point is discussed in Section 3.10.1.

EKT-70: Section 3.6.4 has been modified to include reference to the future plan.

EKT-71: Section 3.7.2 has been modified to refer to the Lower Elwha Klallam Tribe's management of on-reservation recreational resources.

EKT-72: The term "meandering" was used to convey the visual condition of the river. To eliminate any misinterpretation of the term, it has been deleted.

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EKT-72 cont'd meanders" due to geologic controls (horizontal and vertical)? "Numerous, forested islands" would imply channel braiding at changes to a flatter gradient, not a true, low-gradient meandering channel.

EKT-73 § 3.9.2, ¶ 5: The issue is not accessibility, it is scarcity.

EKT-74 ¶ 8: The Applicant has refused compensate tribal members for losses caused by sudden upramps.

EKT-75 § 3.9.3.1, ¶ 5: As was mentioned earlier, the Tribe does not have a directed commercial harvest of chinook on the Elwha. The "200 to 800 fish" presented is a harvest in the non-commercial test fishery which will be ending after 1991.

EKT-76 3-106, ¶ 2: Data supporting the distribution of steelhead harvests needs to be presented.

EKT-77 § 3.10.1, 3-108, ¶ 2: The Treaty of Point no Point should be mentioned. It involved the exchange of large amounts of land for legal protection of Indian fisheries, inter alia. Without an understanding of the bargain that was made, the construction and licensing of the dams cannot be put into an accurate perspective.

EKT-78 3-109, ¶ 2: The usual and accustomed fishing places protected by the treaty should be described.

EKT-79 ¶¶ 3 & 4: There were inland villages on the Elwha; habitation was not limited to the coast. Indian Creek was not the only upstream site.

EKT-80 ¶ 4: The DEIS states that the "...Klallam may have numbered 2,240 before European American contact, but their numbers were quickly reduced during the historic period by diseases...". There were at least 13 villages on the northern coast of the Olympic Peninsula, and camps throughout the San Juans and Beecher Bay. A population figure of 2,240 probably undercounts the pre-contact Klallam. Figures for pre-contact populations in the Northwest vary widely and are primarily a function of the thoroughness and/or lack of knowledge of those who recorded Indian populations without a clear understanding of Northwest Coast Indian settlement patterns and subsistence cycles. Recent studies suggest that the populations they were counting had already been decimated by diseases introduced through trade goods, etc., before actual contact.

EKT-81 3-110, ¶ 1: Skokomish, not Skykomish.

EKT-82 § 3.10.2, generally: The DEIS states [t]he applicant "...surveyed the shorelines of Lakes Aldwell and Mills, as well as the Elwha River shorelines between the reservoirs, and did not

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EKT-73: Comment noted. The subject of this paragraph, however, is accessibility.

EKT-74: Comment noted.

EKT-75: This clarification has been added to the text of Section 3.9.3.1.

EKT-76: See Table 3-11 in main text for harvest distribution.

EKT-77: The DEIS discusses the Treaty of Point No Point and its terms on page 3-109, paragraph 5, and again on page 3-111, paragraph 2.

EKT-78: The usual and accustomed fishing grounds of the Klallam include the rivers on which the Klallam lived and nearby marine areas where they fished in 1855, when the Treaty of Point No Point was signed. This area includes the Elwha River.

EKT-79: See response DOI-105.

EKT-80: Comment noted.

EKT-81: The text has been changed in Section 3.10.1.

EKT-82: This comment covers three topics: 1) archaeological survey intensity, 2) ethnographic identification of potential site locations, and 3) archaeological survey technique.

Archaeological inventories for license application on existing projects focus on area of ongoing impact within the project area. For hydroelectric projects, these usually include shoreline fluctuation zones, access roads, and the project facilities themselves, which must be evaluated for National Register eligibility. Applicants for license for existing projects are not required to draw down existing reservoirs to search for archaeological sites that were inundated prior to the National Historic Preservation Act of 1966. In this context, the applicant's survey (Welch and Wessen, 1987) was more than adequate for identifying cultural resources that a relicensed project might affect, since it included all of the reservoir shoreline that

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EKT-82 cont'd

discover prehistoric archaeological sites (James River, Inc. II, 1987)." The EIS concludes that the lack of archaeological sites is due to the fact that "the most likely places for prehistoric sites are near the river bottoms, under the sediments of Lakes Aldwell and Mills."

We suggest that the archaeological survey was cursory at best, not adequate to reach the conclusion that there are no significant archaeological resources in the area of project impact. We agree that there are prehistoric and historic sites under the reservoirs of Lakes Aldwell and Mills, but it is highly unlikely that these are the only locations of archaeological sites in the project area.

The survey conducted for the project area was, in the words of the archaeologists who conducted it, "a small-scale investigation .... It was not intended to include detailed case by case evaluations." (Wessen and Welch, 1987). The authors further state "... the research design did not seek to articulate the study findings into any particular proposed regional cultural framework nor can the results of this investigation be considered a substantive test of such a model."

The Applicant used ethnographic literature to identify likely locations. But the Applicant's archival and literature review of ethnohistoric resources appears to have been limited to Gunther (1927), Curtis (1913), Waterman (c. 1920), Swindell (1942, in Lane 1975) and Eells (Castile 1985). Almost all report information on Elwha village location and land use which could have been incorporated into a more useful model for field identification of ethnographic and ethnohistoric sites. The Applicant also appears to have contacted one tribal member regarding the location of settlements on the Elwha River, but did not attempt any systematic pattern of interviews.

In addition to minimal archival identification of land use, the field survey was based on landforms considered amenable to land use. The landforms identified for reconnaissance were investigated using pedestrian transects and no shovel testing, ineffective methodology for an area as heavily vegetated as the Olympic Peninsula. It has been demonstrated elsewhere on the Olympic Peninsula that intensive shovel testing and screening of the sediments has identified archaeological sites in heavily vegetated areas (Schalk 1988:169). In fact, as part of development of a predictive model for hunter-gatherer land use in the Olympic National Park, Schalk (personal communication 1991) identified a site through shovel testing at the confluence of Lillian Creek and the upper Elwha River. Shovel testing is also routinely used in conjunction with field reconnaissance in the heavily vegetated areas of western Washington. This methodology is labor intensive, but at least if no cultural resources are identified, one can be sure that none exist.

EKT-82 cont'd

was possible to survey as well as the river bank areas between the two projects and between the Elwha dam and the Elwha River mouth.

When the authors state that their project is "small-scale" and does not include case-by-case evaluations or the implementation of a regional model, they simply mean that the survey focused on inventory of potential project impacts and was not designed for modelling prehistoric settlement patterns in the entire Elwha basin or for determining National Register eligibility of the sites they found. These are appropriate goals for the inventory phase of a licensing study. National Register evaluation would have been a separate phase of work done if the surveyors had located potentially eligible sites.

The archaeological survey made adequate use of Native American ethnographic sources and informants in order to identify potential archaeological site locations. The sources consulted identify a number of protohistoric settlement locations, and the applicant conducted an interview with the only Native American identified and available for interview who was likely to have such information. Archaeologists, however, do not usually find many sites by checking ethnographic sources and interviewing Native Americans. The better ethnographic sources usually list approximate or general site locations that are useful as a rough guide to where archaeological remains might be. Even if these are pinpoint locations, they represent only a small percentage of archaeological deposits built up over 10,000 years of human occupation. The best way to obtain a thorough inventory of archaeological sites is, therefore, to conduct an intensive survey.

The survey crew was equipped with soil augers and shovels, and scraped banks and other exposures to locate subsurface deposits and so did not neglect shovel probing as a matter of survey design as the comment suggests. The survey report states that they "failed to locate areas where (shovel or auger) testing appeared to be either warranted or practical." This was probably because most of the land surveyed was on steep slopes around the shores of the reservoir. The survey transect interval used, 10 meters, is indicative of a more intensive survey than is often done for comparable projects.

In summary, the archaeological survey was adequately conducted. The surveyors did not find sites because they were surveying areas unlikely to contain them.

Schalk has developed land use models for the Olympic Peninsula based on demography and environmental change. The Elwha River is included in the Northslope Rivers and Lowlands Management Zone (1988:146). He writes

> "This zone has the highest potential for archaeological sites of late Pleistocene age...(due) to the marked dryness that must have had unusually high game densities--especially deer. Therefore, it is expected that Old Cordilleran residential bases and locations will occur in relatively high density in this zone. The Upper Elwha has high potential for Old Cordilleran sites that were occupied in the winter season as hunting camps and locations. These should occur on the level areas and especially places with southerly exposure and at the mouths of tributary canyons. Such sites will be found on the third alluvial terraces or even higher benches."

EKT-82 cont'd

Id.

It is clear from Schalk that the ethnographic model for land use, e.g. use of late Holocene river bottoms, is not applicable for prediction of prehistoric hunter-gatherer land use.

The EIS conclusions are premature given the lack of use of current land use models for the Olympic Peninsula and the use of substandard archaeological methodology for site identification.

3-110 to 3-111, carryover ¶: The DEIS states that "No Native American heritage sites have conclusively been identified in the project area of potential effects. However, there is some indication that a site associated with the Klallam Center of the Universe Story might be located within Lake Aldwell. This site may be associated with petroglyphs or artifacts." It is unclear what the definition of a "Native American heritage site" is. The term does not exist in the cultural resource definitions included in the National Historic Preservation Act of 1966.

EKT-83

There is, however, a cultural resource category termed "traditional cultural properties," which would include a location such as the Klallam Center of the Universe. Traditional cultural properties are one of the types of cultural resources required for identification and evaluation under Section 106 of the National Historic Preservation Act of 1966 and subsequent amendments. Guidelines for identification and evaluation are available in National Park Service Bulletin No. 38 (Parker and King). A traditional cultural property has traditional cultural significance and may include, among other types of sites, "a location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world" Id. at 2.

EKT-83: See response EKT-2.

EKT-83 cont'd

Sites connected with the Klallam creation myth, different places where the Creator scooped out material in attempting to fashion man, are located at the Elwha damsite or in the reservoir. Klallams seeking information about how to live their lives would go to the site the Creator is said to have chosen in order to seek guidance. The Applicant's consultants, on having it called to their attention, opined that the sites had been destroyed by the project. It is the Tribe's position that they have been defaced, not destroyed, and the Applicant really ought to get its dam and reservoir off them. Although the EIS mentions these sites, there is no indication of a traditional cultural property study having been conducted, or subsequent discussion of impacts to traditional cultural property sites.

A cursory review of the literature reveals that Waterman (c.1920) locates the Klallam creation site and another site that may have religious significance. Federal cultural resource laws require that traditional cultural properties are identified and evaluated for their eligibility to the National Register of Historic Places. That has not occurred. Such a study should be systematic and consist of literature review, informant interviews with knowledgeable tribal members, and field visits to traditional cultural use sites if these are acceptable to tribal members. Is this study planned? When will it occur? No such study should be attempted, however, until accuracy and confidentiality are assured.

EKT-84

§ 3.10.3, ¶ 3: The comment is made that Klallam fishermen "feel that water level fluctuations caused by dam operations ...." This statement needs stronger emphasis. Many tribal fishers have lost gear, been stranded, and have had their boats threatened by log debris when river levels have changed unexpectedly do to flow increases at the facilities or when the operators are driving trash caught behind the dams.

EKT-85

An early-warning flood alarm system should be installed to warn Lower Elwha residents, whether or not the dams are left in place or removed. While the dams remain, the Applicant should be required, as a condition of any license, to insure against flooding caused or aggravated by the project and list the Tribe and the United States as named insureds.

4.0 ENVIRONMENTAL IMPACTS

EKT-86

§ 4.1.1: "Status quo conditions" also include reduced transport of particulate organic matter and lack of large organic debris below the dams. In addition, the beaches to the East of the rivermouth will continue to erode.

EKT-87

§ 4.1.1.2, ¶ 4: After reporting that the Elwha River bed load has been reduced from 150,000 cubic yards per year to 2,400

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EKT-84: Comment noted. The EIS in Sections 3.9.2 and 3.10.3 mention the threat to safety and loss of equipment that flow changes have caused.

EKT-85: Refer to response EKT-5.

EKT-86: Comment noted.

EKT-87: Comment noted. See response DOI-118.

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EKT-87 cont'd — cubic yards per year, the DEIS says that the sediment supply to the coast is thereby reduced by 35%. In actual fact, river sediment supply to the coast was cut by over 90% according to these figures; the 35% comes from the statement in section 3.2.12 concerning the amount of Ediz Hook sediment supply reduced by damming the river.

EKT-88 — Please note that erosion would also continue of the Elwha Reservation.

EKT-89 — § 4.1.1.3: Staff should also recommend, at a minimum, continued placement of gravel and anchored large organic debris in the armored reaches. Because large woody debris has been retained in the dams, downstream reaches have been deprived of important habitat substrate and flow modification created by wood retained in the channel. Occasional large releases of large wood, reported by tribal members, do not supply large wood at natural rates and are not as likely to be retained as useful refuges for fish and invertebrates.

EKT-90 — The Applicant should be required to arrange and fund ongoing remedial measures on beaches East of the rivermouth.

EKT-91 — The Applicant should be required to install and maintain a telemetered flow gauge in the canyon above Lake Mills in order to provide a better understanding of natural inflows. At about the same location the Applicant should carry out detailed sediment sampling at specified depths across an entire transect on the rising hydrograph in order to measure background sediment levels.

EKT-92 — § 4.1.1.4: The Applicant should fund beach nourishment and protective measures. The cost should be included in the cost of generating power.

EKT-93 — § 4.1.2: Glines Dam actually causes unacceptably low temperatures in the middle reach at certain times. Please note that the lack of normal particulate organic matter transport might be considered a water quality problem.

EKT-94 — § 4.1.2.2, ¶ 1: There appears to be a general misinterpretation of streamflow data between natural flows before both dams were built, and flows after the dams were built. Fall storms around Thanksgiving time and later will fill both reservoirs, and there will be very little reduction in flows from temporary storage. Streamflows will not "resemble natural conditions and flow regimes will not be run-of-the-river at times other than drawdown and filling of Lake Mills.

EKT-95 — ¶ 2: Storm hydrographs will not necessarily be moderated. The Applicant has not been able to correct the sudden releases on top of natural flows which operators send downstream when they become aware of increasing discharges into the reservoirs. Note

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EKT-88: Comment noted. See response DOI-118.

EKT-89: See response DOI-48.

EKT-90: Comment noted.

EKT-91: Comment noted.

EKT-92: Comment noted

EKT-93: Comments noted. Effects of Glines Canyon dam on water temperature are addressed in EKT-49. The staff considers lack of normal particulate organic matter transport as a biological problem, not a water quality problem because state and federal water quality criteria do not address this issue.

EKT-94: Refer to response EKT-24.

EKT-95: Comment noted. Because of the limited storage capacity provided by Lake Mills (maximum 10-foot change in surface elevation), this reservoir has a very limited ability to moderate peak flow events. Once this storage capacity has been depleted during the early periods of extended winter storms, it would have no influence of flows during the remaining periods of these same events.

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EKT-95 cont'd — that "storms" are often rain-on-snow events and that dam operators do not seem able to fine-tune their response to anticipate changes in the hydrograph.

EKT-96 — ¶¶ 3 & 4: Low-flow augmentation should not be based on 1-day minimum flows recorded after the dams were in place. It must be based on the lowest 15- to 30-day low flow periods for flow entering Glines Canyon Reservoir (Lake Mills). How close were the referenced October, 1987 low flows to the actual inflow to Lake Mills? What were the releases out of Lake Aldwell during this time period?

Low flow augmentation has not been that effective.

EKT-97 — ¶ 5: Is the 1987 "critical condition" used as an example by the FERC staff? Without knowing the actual natural flows at the same time, run-of-river operation can only be assumed.

EKT-98 — ¶ 6: The flow augmentation in October, 1987 (Water Year 1988) was probably not the most critical low flow period of record, merely the one which occurred since "run-of-river" operations began. July is a more critical month than November for flow level due to temperature problems and lower minimum monthly flows. November has a higher probability than July for natural inflows to increase.

EKT-99 — ¶ 8: At times, there is a decrease in temperature in the middle reach.

EKT-100 — ¶ 10: How will aeration of the fish passage spills (are these through the fishways, or just for river passage?) affect streamflow temperatures? The spills are presumed to be for instream passage flows.

EKT-101 — § 4.1.3: The word "restoring" implies a return to full natural production; this will not occur with the dams in place. The phrase "self-sustaining" is also misleading; there will always have to be human efforts to ensure passage around the dams.

EKT-102 — § 4.1.3.2, 4-30, ¶ 5: There is a typographical error here. This should read: "Passage survival would be slightly lower...".

EKT-103 — 4-30, last ¶: We suggest that FERC check with the Canadian Department of Fisheries and Oceans for harvest rates on San Juan River stock or for harvest rates of Fraser River sockeye in the Strait of Juan de Fuca. Harvest rates should be low in the Strait, as the region is controlled by PSC Fraser Panel for escapement of Fraser River sockeye and there is no fishery targeting sockeye before fish reach the Strait. Harvests on Cheewhat Lake sockeye, located on the SW coast of Vancouver Island, average 30% (Kim Hyatt, CDFO, pers. comm.).

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EKT-96: Comment noted. To the best of staff's knowledge, no flow measurements were obtained in the river above Lake Mills during October, 1987. Based upon flows measured in the middle reach of the river (McDonald gage) following depletion of Lake Mills flow augmentation storage capacity in late October, natural flows in the river were as low as 190 cfs during this period.

EKT-97: The 1987 critical conditions were based on monthly flow exceedance records observed in the Elwha River. Monthly flows observed during this year had exceedance values of approximately 95 percent, which corresponds to a 1-in-20 year drought event.

EKT-98: Comments noted. The staff did not consider critical low-flow events before run-of-river operation, because these did not correctly portray low-flow conditions which would occur under existing operating conditions.

EKT-99: Comment noted; refer to response EKT-49.

EKT-100: Aeration during fish passage spills will not likely affect water temperatures.

EKT-101: The term "restoring" is not used to mean full natural production, but a self-sustaining wild run. Self-sustaining means the stock can be maintained without indefinite supplementation with a reasonable harvest management plan.

EKT-102: See text changes in Section 4.1.3.2.

EKT-103: Staff concurs with the statement that harvest would be low, and it is stated in the text that most of the harvest would likely occur at the mouth if this stock were available. Whether the Canadian stock distribution and harvest is representative of any future stock on the Elwha is unknown and need not be further investigated.

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EKT-104

4-33, ¶ 6: Benthic invertebrate production may be enhanced by the action of spawning anadromous fish disturbing substrate. Redd preparation turns over gravels and cobbles, releasing fines trapped there and improving oxygen transport, etc.

There needs to be more detailed treatment of benthic invertebrate production. In streams unimpacted by dams, changes in discharge and temperature vary with season and tend to fluctuate more gradually on a daily basis, in contrast to streams below dams that can fluctuate within hours, often out of sync with normal seasonal patterns (e.g. mid-summer high flows, or mid-winter reduced flow)(Ward and Stanford 1979, Petts 1984). Normal daily variations in flow are important cues for stream invertebrates to migrate to quieter water. Extraordinary diel changes associated with flow regulation are unsuitable for many macroinvertebrates that cannot move quickly, and can lead to reduced production (Ward and Stanford 1979).

Also critical to invertebrate production are normal temperature fluctuations (Ward 1976). Absolute accumulations of temperature (degree days) are necessary for growth and maturation; hence, actual daily temperatures, rather than averages, are more relevant to prediction of production. Cold winter minima, as well as warm summer maxima are physiologically required.

EKT-105

There is not a complete description of nutrient processes. This may be the result of not considering sources of nutrients (i.e. dissolved organics in the water). Nutrients are derived primarily from 1) outside the system i.e.. woody and leafy debris; blow-in from minerals; 2) storage within the aquatic environment; and 3) primary and secondary production and decomposition within the system, (algae, invertebrates, and fish). Changes in any component influences productivity and conditions for fish.

Effects of production and nutrient storage within the two dams on the Elwha are not considered in the report. The quantity of nutrients coming out of the dams is dependent in part on location of withdrawal (Ward and Stanford 1983). Therefore potential downstream effects of changing releases from epilimnetic to hypolimnetic must be addressed if dams are retained.

EKT-106

4-34, ¶ 1: There would also be downstream effects on juvenile salmon resulting from sudden fluctuations in stream margins, especially juvenile stranding. There may also be adverse effects related to variations from normal temperature regimes, especially when power drawdown reduces downstream temperatures.

EKT-107

§ 4.1.3.3, ¶ 3: The Tribe strongly supports the statement that the effectiveness of Eicher screens remains uncertain.

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EKT-104: The spawning action would displace invertebrates, but would have minor short-term effects.

This discussion is of current conditions and the statements are valid as presented. A discussion of the benthic environment is not needed for level of evaluation presented. The main question is whether an assessment of the overall benthic environment and nutrient process will change the overall evaluation of restoration potential, and the staff does not believe it will. Benthic production and nutrients are just two of many factors that affect fish production. The staff, therefore, does not believe a more detailed discussion is needed.

EKT-105: This is a discussion of what the applicant's proposed changes would have on the existing dam environment, not on conditions without the dams. While all of these factors might affect fish production, the relationship is poorly known at best, so extensive discussions would have little influence on the assessment of the change in fish stocks.

The effects of increases in epilimnetic releases are difficult to predict but should be minor. Overall, the surface releases will remain a small part of total discharge from the reservoir except under low-flow conditions. The surface releases should increase the production downstream, because they would be carrying a higher density of algae than deep-water releases and supplying food for benthic-feeding organisms. This increased food source would be negatively balanced by reduced dissolved nutrients important for periphyton production. Periphyton is also another important food source for benthic organisms. The exact effect and direction of this change in food and nutrient supply on fish populations are difficult to predict. But the relatively small change from base conditions and partially offsetting effects implies overall changes would be minor.

EKT-106: There would be no sudden fluctuations in downstream margins than what occurs naturally from spring melt and rain runoff because the applicant has agreed to restrict the rate of change in water level.

EKT-107: Comment noted.

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EKT-108 § 4.1.3.3, 4-37, ¶ 1: The Tribe strongly supports FERC's finding that 10 years may not be an appropriate length of time to truly evaluate restoration measures. The Tribe believes it is the Applicant's responsibility, if the dams remain in place, to take an "adaptive management" approach that combines monitoring and evaluation with whatever further restoration efforts may be required. (The Tribe also believes that the Applicant is responsible for full protection, mitigation and enhancement of all species, and that additional programs would have to be funded to achieve this throughout the life of the project.)

EKT-109 § 4.1.3.4: One "unavoidable adverse impact" of the dam retention alternative is that the project will continue to impair production and genetic values in those species which are partially "restored" and to completely cut off the other species.

EKT-110 § 4.1.4.2: The DEIS should state up front that failure to restore chum and pink salmon will result in significantly less biomass accessible to park species.

EKT-111 4-51: Retention will also cause continued loss of riverine wildlife habitat under the reservoirs.

EKT-112 § 4.1.4.3: Retention of the project means continued adverse effects on populations which would use the habitat under the reservoirs and benefit from the biomass returning to the river in its natural state.

EKT-113 § 4.1.5.2, ¶ 5: The Elwha Project has never been licensed.

EKT-114 ¶ 6: The dam retention proposal is clearly inconsistent with the purposes for which Olympic National Park was created. It is also inconsistent with the Treaty of Point No Point's intention to create a permanent home and abiding place for Klallam people.

EKT-115 § 4.1.7: The retention proposal will continue to downgrade the unique aesthetic value of the Elwha River in the lower 48 states: a free-flowing river where one can travel from the ocean to the glaciers witnessing the yearly cycle of the pacific salmon, a phenomenon of sacred importance to the Klallam people.

EKT-116 § 4.1.8, ¶ 1: The Tribe agrees entirely that the adverse impacts of the Applicant's proposal would be selective, actually increasing the ongoing dam retention cost borne by the Tribe in the name of "fisheries restoration."

EKT-117 ¶ 2: The Tribe also agrees that this would take place without significant power cost savings for Daishowa. In fact, the full cost of mitigation, enhancement and compensation for all species will be far in excess of the cost computed in this DEIS.

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EKT-108: Comment noted. See Section 4.1.3.3 for recommendations considered.

EKT-109: This section refers to changes from existing conditions, which the staff believes are accurately described.

EKT-110: Section 4.1.4.2 has been modified to include a discussion of the effects of not restoring pink and chum salmon to the Elwha system on biomass available for wildlife.

EKT-111: In considering the licensing of existing projects, the Commission adopts a forward-looking approach using present-day conditions as baseline. Impacts are only identified for actions which involve a change in current project operations or conditions.

EKT-112: See response EKT-111.

EKT-113: Any reference to relicensing has been deleted from Section 4.1.5.2.

EKT-114: Comment noted.

EKT-115: Comment noted.

EKT-116: Comment noted.

EKT-117: Comment noted.

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EKT-118 § 4.1.8.2, ¶ 7: There is no such thing as a "personal use test-fishery". The test-fishery is a four year program which will end in 1991. No plans have been made by the Tribe to begin an in-river chinook fishery, commercial or otherwise, after 1991.

EKT-119 4-69, Tribal Social Effects: The Tribe strongly supports the finding of significant negative economic impact of the Applicants proposal on the Tribe. Socio-economic impacts would not limited to lost fisheries value. The Tribe would continue to be concerned about the safety of the dams. The Tribe would continue to be denied access to a major portion of its cultural heritage, including usual and accustomed fishing sites protected by Treaty and the Klallam creation site. The two dams would continue to exist as an insult to the identity and values of the Tribe. They would remain a constant reminder of the powerlessness of tribal members to prevent or remedy a nuisance that has plagued generations of Elwha Klallam people. If the social problems of the Tribe can to some degree be traced back to a sense of hopelessness, certainly the killing of the river in the name of "cheap" power by a dam that has been a safety hazard for most of its 80 years has something to do with that.

EKT-120 4-69, Cost of Power: The Tribe does not agree with the millage computed for the retention alternative. The cost of compensation for stocks that cannot be "restored" under the Applicant's proposal has not been factored in. Annual charges commensurate with the power benefits from poundage on federal lands do not appear to have been counted. A number of mitigation measures, such as channel and beach repair and maintenance, are not presently included in costs. And so forth.

EKT-121 § 4.1.8.4: To the "unavoidable adverse impacts" the Commission must add the ongoing impacts already caused by the dams.

EKT-122 Effects on the reservation's beaches must be included along with Ediz Hook.

EKT-123 § 4.2.1, general comments: Many of the conclusions reached in this section are the result of computer simulation using an hydraulic model, the HEC-6 model. When the Tribe first received a copy of the DEIS, in early March, it requested a copy of the transects and other inputs into the model and the statistical output so that the Tribe's channel mechanics consultant could review the DEIS more effectively. That data did not become available until mid-May. During the interim the Tribe's channel consultant learned that the DEIS authors did not use the published version of the HEC-6 model; instead, they used the "Beta" version, which will only become available for public review sometime this month. By the deadline for commenting on the DEIS, June 28, the Tribe's engineering and geomorphology consultants will not have had sufficient time to review and comment on the conclusions derived

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EKT-118: Reference to the personal use test fishery has been deleted from the discussion of project effects.

EKT-119: Sections 3.9.2 and 4.1.8.2 have been revised to take note of the Tribe's position regarding the dams. Sections 3.10 and 4.9 (Cultural Resources) also address these points. With regard to the safety of the dams, staff understands that this is of concern to the Tribe, but believes that the dams, which are regularly inspected, are safe.

EKT-120: The discussion of the cost of power is meant to reflect only the cost that would actually have to be paid by Daishowa America. It does not include other costs, which are addressed separately.

EKT-121: Staff disagrees. In making its licensing decisions, the Commission focuses on future impacts and balancing future needs, not on past impacts.

EKT-122: Section 4.1.8.4 has been revised to include this point.

EKT-123: Comment noted. See response EKT-3.

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EKT-123 cont'd

from the Beta Version.

Unless additional time is allowed by the Commission, the DEIS cannot be given public or governmental review in any constructive manner. Perhaps the key issue in the choice of removal or retention alternatives is sediment management. The ability of the lower river to carry bedload released from former reservoirs is critical. That ability was computed in a closed system not subject to meaningful review within the time allowed: An unpublished version of the computer model was used to "fail" upstream sediment storage and simulate the deposition of sediments downstream. The Tribe has more at stake than any other party in the resolution of the sediment management issue. It will need an additional 60 days to install the model; review simulation using the FERC/Ebasco inputs; review the model's response to other sediment storage, hydraulic and hydrologic inputs; consult with the Corps of Engineers, the Washington Department of Ecology, and other technical agencies; and prepare supplemental comments.

EKT-124

§ 4.2.1.1, 4-77, ¶ 4: The use of terraces with revegetation may not be the most cost-effective method of sediment management in the reservoirs.

EKT-125

Last sentence: there are critical times in August and September when glacial melt is the major source of Elwha River streamflow.

EKT-126

¶ 5, predicted sand and silt concentrations: In order to comment the Tribe must have additional time to review HEC-6 Beta modelling. The significance of turbidity levels discussed here and _seriatim_ must also be established; species indigenous to the Elwha or similar streams probably have a high tolerance for glacial turbidity. Spot checks conducted by the Tribe to measure turbidity during the floods of 1990 found levels approaching 1,000 mg/l at flows of approximately 10,000 cfs.

EKT-127

4-78, ¶ 1: "Observation of the channel conditions ....": There are no data reported here or elsewhere to substantiate this statement. What procedures were used to measure bedload and to analyze the size of bedload and suspended sediment? What were the measured quantities of bedload and suspended sediment? For the reach in question, how did HEC-6 predicted volume of bed load transport and suspended sediment transport for similar flow and cross sections compared to measured values? Was HEC-6 calibrated against measured data?

EKT-128

4-79, ¶ 4, transport rates: In order to comment the Tribe must have additional time to review HEC-6 Beta modelling.

EKT-129

4-80 and 81, post-project sediment loads: In order to comment the Tribe must have additional time to review HEC-6 Beta modelling.

EKT-124: Comment noted.

EKT-125: Comment noted.

EKT-126: Comment noted.

EKT-127: See Appendix C for a discussion of methods used in the analysis.

EKT-128: Comment noted.

EKT-129: Comment noted.

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EKT-130 § 4.2.1.2, 4-82 to 83, long term impacts, including aggradation: In order to comment the Tribe must have additional time to review HEC-6 Beta modelling. What "hydraulic control" is referred to? Is it man-made?

EKT-131 § 4.2.1.4: In order to comment the Tribe must have additional time to review HEC-6 Beta modelling.

EKT-132 § 4.2.2.1, generally: In order to comment the Tribe must have additional time to review HEC-6 Beta modelling. The discussion of turbidity would also be assisted by a more complete understanding of background turbidity levels. Turbidity needs to be measured at various levels across a transect above Lake Mills, on the rising hydrograph.

EKT-133 ¶ 1: The DEIS should not leave the casual reader with the impression that the dams provided significant flood storage. Flood storage is minimal now.

EKT-134 4-87, ¶ 3: The statement is made that adverse sediment loads could be expected 35 days per year. Is there data on present number of days each year that sediment loading might be considered "adverse"?

EKT-135 ¶ 4: In order to comment fully the Tribe must have additional time to review HEC-6 Beta modelling. The discussion of turbidity would also be assisted by a more complete understanding of background turbidity levels. Turbidity needs to be measured at various levels across a transect above Lake Mills, on the rising hydrograph.

EKT-136 §4.2.2.2, ¶ 1: The concentration of fish in a portion of the lower river made temperatures and flow there more critical than would be the case with free fish access to habitat upstream of Elwha dam. Flow augmentation, which has not worked that well anyway, would become irrelevant.

EKT-137 § 4.2.2.4, 4-92, ¶ 2: It is unclear if the DEIS authors understand the nature of the WDF rearing channel. Due to present conditions on the river, it is not possible to use the channel during a large portion of the year because water temperatures are too high. Fish are transferred out of the system for early rearing and are returned to the facility only for their final rearing the winter before their release.

EKT-138 § 4.2.3: It is not that clear that resident trout would decline in a more diverse and free-flowing stream. Benefits to shellfish populations at Angeles Point and Ediz Hook should be disclosed.

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EKT-130: Comment noted. The hydraulic control mentioned in the DEIS is in reference to the present channel conditions in the area or River Mile 1 where at high flows the water surface elevation is higher because the river is constrained relative to downstream sections. This is the type of channel section that the river would naturally jump to a new channel. With construction of the set-back levee by the Corps, the floods no longer have access to the entire historical river mouth area.

EKT-131: Comment noted.

EKT-132: Comment noted.

EKT-133: Comment noted; refer to response EKT-95.

EKT-134: These values have been revised in Section 4.2.2.1. Because suspended sediment and turbidity values for the Elwha River are only measured on a quarterly basis by the U.S. Geological Survey, it is not possible to describe the number of days under existing conditions for which sediment loading would be considered adverse.

EKT-135: Comments noted.

EKT-136: Comment noted.

EKT-137: Information noted. The EIS states that the dam removal alternatives will have the most adverse effect on the WDF fish rearing channel during winter high-flow periods, a time when fish are present in the rearing facility. The staff recognizes the rearing facility does not operate when water temperatures are too high.

EKT-138: While some areas, such as the middle reach (about 20 percent of the total river habitat), might have an overall increase in resident fish, this accounts for only a small portion of the overall river habitat that would not contain presumably abundant anadromous and less abundant resident stocks. The competition with anadromous fish in most of the stream should reduce the resident populations unless the stocks of anadromous fish remain low.

Benefits to shellfish, which may include part of Angeles Point if the estuary expands, are discussed in Section 4.2.3.2. Beyond Angeles Point, the sediment input would remain minor compared to existing conditions as discussed in Section 4.2.1.2. One reason is that the nearshore hydrology has the capability to wash more sediment away than would be deposited by the river. The overall effect cannot be accurately predicted, but the probability of increases in shellfish from beyond the estuary and Angeles Point seems remote based on the expected hydraulic conditions.

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EKT-139 § 4.2.3.1, ¶ 2: Was temporary upstream fish passage considered at Elwha Dam?

EKT-140 ¶ 3: It is unclear how dam removal would have "moderate-to-severe adverse effects" on fish populations if the concentrations of sediment were "acceptable to fish".

EKT-141 4-95, ¶ 2: High turbidity is a normal occurrence at the rearing channel under present conditions.

EKT-142 § 4.2.3.2, 4-95 to 96: Would the new channel only meander? Would it not also braid as loads and gradients change?

EKT-143 4-96, ¶ 2: In order to comment fully the Tribe must have additional time to review HEC-6 Beta modelling.

EKT-144 § 4.2.3.4, ¶ 1: The Tribe suggests a shorter construction period.

EKT-145 4-103, ¶ 6: The Tribe believes that there is actually a "fair" chance of restoring a sockeye run to the Elwha River if the two dams are removed. The habitat in Lake Sutherland is believed very similar to that in Cheewhat Lake on Vancouver Island. That lake supports a healthy sockeye population.

EKT-146 § 4.2.4.1, 4-110, ¶ 1: The Tribe agrees that there will be no net loss of wetland quantity or function if the dams are removed. Side channels and backwater areas should easily make up for any losses of existing delta or shore areas.

EKT-147 4-111, ¶ 1: A management plan should be put into place within the watershed which will limit permitting and actions at odds with ecosystem restoration.

EKT-148 § 4.2.4.2, 4-119, Table 4-20: If it is accepted that Sockeye actually have a fair chance of survival, it is inappropriate to assume 0 biomass contribution from sockeye. Cheewhat Lake, similar in size and habitat to Lake Sutherland, supports a sockeye run which ranges in size from 3000 to 15,000 adults. These figures should be used as a guideline to establish the expected biomass contribution to the Elwha River system by sockeye.

EKT-149 4-120,. ¶ 1: "Removal of both dams would increase the erosive capacity of the Elwha River below the current site of Glines Canyon Dam". This statement is not supported by data or explanation. There is now a "clear-water" discharge below the dam and the river has downcut the channel at the McDonald Bridge gage site.

EKT-150 § 4.2.4.3, ¶ 1: A basin management plan would ensure preservation of raptor habitat in old growth along the Elwha.

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EKT-139: No temporary upstream facility was considered at the Elwha dam. Fish arriving here will not be destined for up-river areas, so a temporary facility would not be very effective at capturing fish. Also, some fish that would be transported upstream may try to return to the lower river, further reducing the effectiveness of this activity. However, an upstream adult trap and other activities for collecting brood stock for juvenile rearing and upstream stocking activity was proposed as part of the staff-recommended restoration plan (Appendix A, Section 3, Part 3.3).

EKT-140: See text change in Section 4.2.3.1.

EKT-141: Turbidity of the magnitude and frequency of what will occur is far from normal and would cause significant mortalities.

EKT-142: The text has been changed in Section 4.2.3.2.

EKT-143: Comment noted. However, no additional time is available for review.

EKT-144: The construction period was reduced to 3 years.

EKT-145: See responses DOI-53 and DOI-154. The staff retains its classification of "poor" based on available information. The lake listed is just one example and does not indicate sockeye could be established in this system.

EKT-146: Comment noted.

EKT-147: The staff agrees. However, a management plan for the watershed is beyond the mandate of the Commission and the scope of this EIS. Such a plan should be developed by the resource agencies involved in the restoration process.

EKT-148: The staff believes that the restoration potential for sockeye salmon is poor under all of the alternatives. Consequently, sockeye were not included in the biomass calculations.

EKT-149: Sections 4.2.4.1, 4.2.4.2, 4.3.4.1, 4.3.4.2, 4.4.4.1 and 4.4.4.2 have been modified to indicate that dam removal is likely to increase the lateral erosive capability of the river in some areas downstream of the current dam locations. As stated in Section 4.2.1.2, dam removal would increase the sediment supply to the middle and lower reaches of the river resulting in more active channel shifting, bank erosion, and creation of side channels.

EKT-150: See response EKT-147.

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EKT-151 § 4.2.5.1, 4-125, ¶ 3: Some amount of the tunnel spoils and rubble might be used on site for bank stabilization under a more conservative sediment management scenario, depending on aesthetics and land use constraints.

EKT-152 § 4.2.7.2: The DEIS simply does not do justice to the unique value, in the lower 48 states and within 1-3 hours of several urban centers (Seattle, Tacoma, Vancouver, Victoria) of an "Alaska-like" glacial stream with salmon returning from saltwater to the heart of a national park during the height of the tourist season. In June, 1991, media coverage of disappearing Northwest salmon has become intensive, with repeated references to the belief by local residents that salmon are an essential part of the regional identity for all Northwest residents, including competing users of the region's waterways. (National Public Radio, Morning Edition, June 17, 1991; Seattle Times, June 16, 1991)

EKT-153 § 4.2.8: The Tribe agrees emphatically. Of the two alternatives, dam retention will actually add to the cost already being carried by the Tribe and dam removal will remove that burden and offer positive benefits.

EKT-154 § 4.2.8.2: The cost of power with dam retention is underestimated in this document; the cost of power with dam removal is overestimated.

EKT-155 4-135, ¶ 2: The Tribe would also benefit from the restoration of traditional cultural properties in the project area, especially the creation site(s). The constant presence of Elwha dam, which the Tribe considers unsafe, and which continues to release sudden increments of water and trash into the lower river, would finally end. The erosion of reservation beaches would be balanced by constant replenishment from the river. Increased tourism to a now unique stream system would increase economic opportunity on the reservation.

EKT-156 ¶ 4: As was discussed earlier, the power cost comparison may actually favor Daishowa switching to less expensive BPA power.

EKT-157 4-136, ¶ 2: See comment on § 4.2.7.2, above.

EKT-158 ¶ 5: The Tribe is exploring several approaches to protecting the municipal, industrial and spawning channel water supply. Remedial measures with positive benefits for both the Tribe (less interference with summer-fall low flows) and the diverters (a cleaner and more reliable supply) can be negotiated. The alternative, regardless of hydropower issues, is confrontation and litigation over increasing surface diversion by the City and the presence of an unpermitted diversion dam at the City's works.

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EKT-151: Comment noted; however, the staff is assuming a worst case to ensure disclosure o all potential impacts.

EKT-152: Comment noted.

EKT-153: Comment noted.

EKT-154: The cost of power under each alternative has been recalculated for the FEIS based on new data and revised calculations (see Section 2.7).

EKT-155: Section 4.2.8.2 has been revised to include these points.

EKT-156: Comment noted.

EKT-157: Staff believes that acknowledgement of "substantial potential benefits to the local and regional tourism industry" adequately covers this point.

EKT-158: Comment noted

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EKT-159 § 4.2.8.4, ¶ 2: We disagree with the cost comparison.

EKT-160 § 4.2.9.1: Traditional cultural properties need to be covered.

EKT-161 § 4.3.1.4: There is no dam safety treatment in this section. There should be; the alternative poses a serious hazard to the reservation. Removal of Glines Canyon Dam alone will result in accelerated accumulation of sediments, in a fluid medium, behind Elwha Dam. Elwha Dam has been post-tensioned to withstand the overturning pressure of a column of water during a probable maximum flood against the upstream face of the main dam section. Mineral sediments have a significantly higher specific gravity than water, and their presence will increase the toppling moment significantly. The Tribe doubts that the repairs made to Elwha Dam took this into consideration and questions whether an adequate safety factor was computed-in. During seismic events, the storage of liquified sediments becomes an even greater risk for what is essentially a jury-rigged dam. Dam failure would involve not just a bore wave but a release of a channel-choking mass of sand and silt, overcoming flood control measures and releasing considerably more energy onto the floodplain.

EKT-162 § 4.3.3.4: The continued inaccessibility of pink and chum habitat should be listed as an unavoidable adverse impact of giving the (presently unlicensed) Elwha Dam a license to occupy the waterway. Pink and chum are very significant to Indian fisheries.

EKT-163 § 4.3.4.2, 4-152: Note that the mass spawners, pink and chum, are not reintroduced under this sub-alternative.

EKT-164 § 4.3.8.2, ¶ 3: Note the safety comment, above; the loss of pink and chum salmon to tribal fisheries; and the continuation of beach erosion.

EKT-165 ¶ 4: The Applicant has not made any proposal for chum or pink salmon compensation. The cost of power is understated.

EKT-166 4-163, ¶ 3: Note the safety hazard.

EKT-167 § 4.3.9.4: Traditional cultural properties are omitted. There would be a significant adverse impact on cultural resources from retention of Elwha Dam.

EKT-168 § 4.4.1.4, ¶ 2: The middle reach of the river would continue to lack suitable substrate, channel structure (including large woody debris), and a more diverse array of side channel habitat.

EKT-169 § 4.4.2.2, ¶ 1: The river will not follow the natural hydrograph and temperature regime, with adverse fishery effects.

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EKT-159: See response EKT-154.

EKT-160: See response EKT-2.

EKT-161: Refer to responses EKT-5 and EKT-16.

EKT-162: The existing environment does not have access for pink and chum salmon to the upper river so any lack of access is not an unavoidable adverse impact. This section only discusses changes from existing conditions.

EKT-163: Section 4.3.4.2 has been modified to include a discussion of the effects of not restoring pink and chum salmon to the Elwha system on biomass available for wildlife.

EKT-164: Section 4.3.8.2 has been revised to address these points.

EKT-165: See response EKT-120.

EKT-166: See responses EKT-119 and EKT-164.

EKT-167: See response EKT-2.

EKT-168: Comment noted.

EKT-169: Comment noted.

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EKT-170 § 4.4.4.2, 4-179, ¶ 2: Why would erosive capacity be increased with the falls still in place and increased sediment load?

EKT-171 § 4.4.5.2, 4-184, ¶ 2: Has the Staff determined that use of National Park lands for hydropower poundage is consistent with the purpose for which the Park was created? What is the public benefit from the use of federal lands for private power generation? How is the federal government compensated?

EKT-172 § 4.4.7.4: The unique Park value associated with salmon spawning to at least river mile 43 would be lost.

EKT-173 § 4.4.8.2, ¶¶ 2 & 3: Coho and winter steelhead are the Tribe's currently significant fisheries. It is not prudent management to commit those fisheries away and wait for chinook, pink and chum to reach harvestable levels of marketable fish

EKT-174 ¶ 4: The cost of power does not currently include compensation for lost coho and winter steelhead or annual charges for power benefits derived from occupation of federal lands.

EKT-175 § 4.5.1, ¶ 1: There are semantic problems with the way that the "increased regional load" is treated. The addition of about 20 average megawatts to load served by the regional grid is not a significant addition to whatever growth curve is driving resource acquisition. Under the current 75% probability growth scenario the added load can be taken care of by conservation. About 15 MW are available just by shutting down one grinder at the Daishowa mill as part of the mill's conversion to a recycling facility. More MW are available as the result of improved efficiency. We understand that an energy audit is scheduled.

EKT-176 § 4.5.2, ¶ 2: Our understanding is also that the voltage problem is specific to the Puget Sound Region, not to Port Angeles alone. We also understand from BPA that the deletion of the two hydro facilities will not have any significant effect.

EKT-177 § 4.6, generally: Perhaps the reader should be given a clearer understanding that the Elwha river is one of the few remaining salmon streams in the United States, outside of Alaska, containing large units of salmon habitat that is both pristine and federally protected in that state. And the DEIS should point out the information potential that will be foregone by licensing the dam: The upper reaches of the river contain a "blueprint" of unspoiled habitat. Restoration would involve considerable opportunities for research.

EKT-178 ¶ 4: The added risk posed by the storage of additional sediments in the reservoirs for an hypothetical license period is disturbing to the Tribe. Our engineering evaluation, like the

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EKT-170: See response EKT-149.

EKT-171: Section 4.4.5.2 addresses consistency with comprehensive plans, of which some NPS plans reference park enabling legislation. The park enabling legislation recognized the presence of Lake Mills and the Glines Canyon Project when the park boundaries were established.

EKT-172: The removal of the Elwha Project would allow salmon spawning to occur above the project.

EKT-173: Section 4.4.8.2 has been clarified as suggested.

EKT-174: See response EKT-120.

EKT-175: Loss of Elwha and Glines Canyon generation would have to be made up by other conservation or generation resources within the region, which in turn would then be unavailable to meet other regional loads.

EKT-176: The comment appears consistent with the EIS text.

EKT-177: Section 4.6 has been revised as suggested.

EKT-178: Comment noted.

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COMMENTS OF ELWHA KLALLAM TRIBE

EKT-178 cont'd | Commission's, is that current amounts of sediment are manageable within realistic cost limits. That opportunity will indeed be committed away should the dams be licensed for 30-50 years.

5.0 SUMMARY AND STAFF CONCLUSIONS

EKT-179 | ¶ 6: Clearly the Elwha spring chinook genetic stock is of special importance, as is the habitat in which that stock evolved.

EKT-180 | § 5.1.1, ¶ 3: Additional research should be conducted concerning historical presence of sockeye, such as core samples of lake sediments, as well as the potential for (re)introducing sockeye above current barriers. The Tribe does not believe habitat is limited for this species.

EKT-181 | § 5.2.7, ¶ 3: The aesthetic benefit derived from restoration of anadromy in the Park should be disclosed.

EKT-182 | § 5.2.9: There has been no traditional cultural properties survey. There are important sites in the project area which are probably eligible for inclusion in the National Register. This section should not suggest that the only Indian cultural use is fishing.

EKT-183 | § 5.3, generally: Is the EIS intended to inform the Commission concerning "consistency" under § 4 (e) of the Federal Power Act?

EKT-184 | § 5.4, ¶ 2: Error in computing replacement power cost seriously inflates the power cost of removing the dams.

EKT-185 | § 5.6, ¶ 3: The DEIS says that the Applicant's proposal would provide a "meaningful improvement." The word "meaningful" is somewhat ironic when applied to the Tribe; the alternative would impair already limited treaty fisheries and exacerbate poverty while continuing all of the existing project's ongoing effects. The word "improvement" must be in reference to some hypothetical beneficiary. Fisheries will suffer, adverse impacts on other values will continue, and the Applicant will have significant added costs.

EKT-186 | ¶ 10: $245 million is too high.

EKT-187 | 5-25, ¶ 1: Terracing without higher levels of stabilization will "release large amounts of sediment." Conventional storage and stabilization techniques can reduce the release of sediment to well within acceptable limits.

RESPONSES TO ELWHA KLALLAM TRIBE

EKT-179: Comment noted.

EKT-180: The staff does not believe additional studies at the expense of the applicant are warranted. Core samples may or may not indicate historical presence because kokanee were possibly present in the lake in the past. See responses DOI-53 and DOI-154.

EKT-181: Section 4 2.7.2 mentions that removal of the projects would allow visitors the opportunity to view migrating and spawning salmon and steelhead trout. Section 5.2.7 has been modified to mention migrating anadromous fish.

EKT-182: See response EKT-2.

EKT-183: The role of the EIS in addressing Commission responsibilities under Section 4(e) of the Federal Power Act is described in Section 5 6.2.

EKT-184: Refer to response EKT-37.

EKT-185: The referenced word has been deleted.

EKT-186: The staff's revised estimate is $235 million

EKT-187: Comment noted.

APPENDIX A: PROJECT ALTERNATIVES AND COST ESTIMATES

PART 3 - DAM REMOVAL PLAN

EKT-188

Over the past year, two of the Tribe's engineering consultants, Summit Technology with R.W. Beck and Associates, have been preparing a feasibility level analysis of various dam removal and sediment management scenarios. What follows is a comparison of their "Scenario 1" --a conservative approach to sediment management which is designed to allow minimum releases of sediment from in-reservoir storage-- to the approach described in the DEIS at §§ 2.3 & 4.2, and in more detail in Appendix A:

The plans for removal of the Elwha and Glines Canyon project presented in the FERC DEIS have been organized in three and four main elements respectively.

These elements are listed below for each part of the project.

Elwha:

1. Use of an open-gated diversion tunnel.
2. In-reservoir sediment management.
3. Complete dam removal.

Glines Canyon:

1. Use of an open gated diversion tunnel.
2. Use of an open-channel bypass to dilute tunnel effluent.
3. In-reservoir sediment management.
4. Complete dam removal.

The plan proposed by Summit Technology in association with R. W. Beck and Associates presents similar elements to those presented by FERC, except for the second element of the Glines Canyon plan which uses an open-channel bypass to dilute sediment concentrations at discharges from the diversion tunnel. A by-pass channel is not part of the Summit proposal. Techniques suggested in our plan dilute river flow before the entrance to the tunnel.

Presented in table form, below, are the basic elements of the FERC plan as compared to the Summit plan.

EKT-188: A number of refinements have been incorporated into the dam removal plan (Sectio 2.3.2), many of which result in a plan more similar to the one described. At Gline Canyon, the bypass channel has been eliminated from consideration because of the potential complexities and difficulties. Also, at each of the dams, a structure removal element has been included to provide flood flow capability that would generally prevent inundation of previously stabilized sediments and provide relatively clean water bypass as necessary. More extensive elements involving hydraulic dredging in developing the main channels have also been incorporated. Additionally, generally greater slope protection measures have been incorporated. The overall changes result in a shorter construction period similar to that contained in the comment.

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EKT-188 cont'd

Design Approach

FERC DEIS	SUMMIT TECHNOLOGY
1. The reservoir would be scoured hydraulically to find the pre-existing channel. Scoured silt would be transported downstream. Silt not transported by scour would be allowed to remain in place. Future flood events might, after construction, transport this silt downstream. Silt transport might result in high turbidity levels which might adversely affect aquatic organisms.	1. The historic river channel would be determined through a bathymetric survey, test boring, and sounding. Silt in the channel would be hydraulically dredged, dewatered and stabilized in storage cells behind berms adjacent to the river before the lake level is lowered. The construction process would be designed to keep turbidity levels as low as possible.
2. At Glines Canyon a bypass channel would be used to mix clean water with turbid water from construction at the outlet of the bypass tunnel.	2. The lakes would be lowered gradually and used as settling basins to reduce the size and amount of sediment transported from the project during construction.[3]

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[3]/ Preliminary calculations indicated turbidity levels can be held near natural levels for most of the construction. Construction of a bypass channel poses serious aesthetic and technical problems.

EKT-188 cont'd

COMMENTS OF ELWHA KLALLAM TRIBE	RESPONSES TO ELWHA KLALLAM TRIBE
3. The river channel would be armored naturally and mechanically by placing unspecified amounts of organic and inorganic material along embankments. Some lateral migration and erosion of embankment areas would be possible.	3. Mechanical armoring, made up of granular, graded delta material in the form of berms, would protect stored sediments from erosion and lateral migration during and after construction. Additionally the berms would act as graded filters to reduce erosion and quantities of fine sediment introduced into the river from behind the berms.
4. Sediment from delta and lake bed areas would be relocated adjacent to the previous channel.[4]	4. Same as FERC approach, with one major exception: Sediment would be stored behind berms designed to block escape of sand and silt or unravelling of storage sites.
5. Rubble from dam demolition would be placed in lake bed areas.	5. Same as FERC approach.
6. Vegetation and erosion control blankets would be used to stabilize relocated material.	6. Same as FERC approach, but we would also use a temporary piping system and lined channels to divert major streams into the river and to reduce upland erosion.

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[4]/ Relocated material would be placed in terraces.

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COMMENTS OF ELWHA KLALLAM TRIBE	RESPONSES TO ELWHA KLALLAM TRIBE
7. Riverbed elevation would rise as a result of increased sediment flow from the upstream supply and erosion from lake bed sediments.	7. Only small amounts of sand-sized material would pass down-river during construction, causing little or no aggradation. Silt- and clay-sized material would pass through the project during construction but would not accumulate in downstream reaches. The berm would also act to protect the channel from erosion.
8. Flood protection from the Tribe's levee would be reduced as a result of deposition of sand-sized sediment in slow moving areas near the levee.	8. Only minor amounts of sediment from the delta area would be carried down-stream. Flood protection from the levee would not be compromised by construction activities
9. Each dam would remain in place until sediment stabilization was complete.	9. Same as FERC approach.

EKT-188 cont'd

ELWHA TRIBE'S DEIS COMMENTS
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Construction Sequence

EKT-188 cont'd

FERC DEIS	SUMMIT TECHNOLOGY
1. Construct open channel by-pass and draw lake level down to expose delta.	1. Same as FERC approach without by-pass channel.
2. Erode material hydraulically using river flow. Use dredging to control channel alignment during drawdown.	2. Cut channel using hydraulic dredge and mechanical excavators to limit amount of erosion and reduce turbidity. Temporarily store granular delta material adjacent to cut area.
3. Use conventional excavation methods, including dredging, to move material to terraced sites once surfaces are exposed by drawdown.	3. Construct berms. Begin lake channel dredging. Place dredged material in cells constructed by berms. Mix heavier material from stored sites with finer sediments to increase overall stability of lake bed material.
4. Finer material from lakebed and delta to be hydraulically eroded through the diversion tunnel into the river beyond the dam. Discharge from Lake Mills to be mixed with clear water from bypass to reduce turbidity.	4. Dredge River Channel ahead of berm construction. Continue to construct berms from stored material as lake elevation is lowered. The berms, will act to restrict to fine sediments from entering the river flow, function as a gravity retaining structure and as an extension of the haul road.

COMMENTS OF ELWHA KLALLAM TRIBE				RESPONSES TO ELWHA KLALLAM TRIBE
5.	Draw down at one to two feet per day.	5.	Water level is lowered at a rate which allows dredging process to first remove channel sediment. Water level will also be governed by turbidity levels in the lake. Higher water elevations will help dilute concentrations of suspended sediments.	
6.	Grade and construct terraces. Face of terrace slopes at 1 Vertical to 4.5 Horizontal.	6.	After material behind berms has dried, consolidate material with mechanical compactors to increase stability and decrease future settlement. Berms would be constructed at 1 vertical to 4 horizontal slopes (1V:4H). Fine material will be placed at 1V:10H.	
7.	Stabilize terraces and slopes with vegetation and soil reinforcement mats.	7.	Stabilize slopes by seeding and other organic erosion control measures. Use temporary piping systems to divert water from adjacent slopes and decrease erosion of newly placed materials.	

EKT-188 cont'd

EKT-188 cont'd

Construction Schedule

FERC DEIS	SUMMIT TECHNOLOGY
1. Engineering and permitting prior to construction.	1. Same as FERC approach.
2. Construction requires 5 years to complete. Work is assumed to be done seasonally from March through October.	2. Construction requires 2 1/2 years to complete from notice-to-proceed to final grading. Work is assumed to be continuous. Some tasks may have to be rescheduled according to river flows and weather.
3. Work force ranges from 18 to 48 people assuming 8 hour days.	3. Work force ranges from 65 to 105 people based on 8 hour days, without shutdown times for weather related problems. Double shift construction could reduce construction schedule.
4. Work at both sites would occur independently but concurrently.	4. Same as FERC approach.
5. Year 1: Construct diversion tunnel and associated control works.	5. Year 1: No construction activities until October to take maximum advantage of river flow characteristics. Mobilization and construction of temporary docking structures will be completed in the first three months. Clearing and grubbing dam demolition preparatory work and Phase 1 sediment removal work will begin in December of the first year.

ELWHA TRIBE'S DEIS COMMENTS
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EKT-188
cont'd

6. Years 2-4: Lower reservoir and stabilize sediment.

6. Year 2: Temporary erosion control around lake perimeters, excavation of delta channels, preparatory work on dam removal, temporary road construction, diversion tunnel / cofferdam / lake tap construction and powerhouse removal.

7. Year 5: Physical removal of dam and spillway structures and regrading.

7. Year 3: Dredge fine materials in lake bed area, dredge new river channel, dam removal, final grading and demobilization. Temporary erosion control will continue for many months after project completion.

COMMENTS OF ELWHA KLALLAM TRIBE

EKT-188 cont'd

Summit also did a general cost comparison between the two approaches. Using a conservative costing technique (20% contingency), the additional estimated cost for the Summit approach to sediment management is about $26 million. This increment will purchase maximum sediment protection. Less expensive scenarios can be explored depending on the level of protection considered appropriate. Further analysis of those scenarios depends on use of the HEC-6 Beta model.

APPENDIX B: FISH PASSAGE AND POPULATION PARAMETERS

EKT-189

§ B.1.1.1, B-5, ¶ 2: The Tribe does not believe this statement to be valid. It is more likely that the distance the floodgate is opened has more to do with the survival of the fish than the problems in the splash pool. Until proven otherwise, we believe that a larger opening on the floodgate, and so greater spill, is required.

EKT-190

§ B.1.1.5: The Tribe believes that mortality from scale loss may be high when fish enter salt water as it is quite likely that they will be exposed to salt water less than 24 hours after passing the Elwha Dam. A raft drifting in the current takes approximately 3 hours to travel to the mouth of the river from the base of Elwha dam. Most fish passing over the dam will be actively migrating, suggesting that they will reach salt water in less than 3 hours. In support of this concept of rapid migration, as many as 40,000 coho have been observed volitionally leaving the Lower Elwha Hatchery and travelling the entire 1/4 mile distance of the hatchery's outfall overnight.

§ B.2.2, B-22, last ¶: Georgia Strait is actually located between Vancouver Island and mainland British Columbia.

EKT-191

Thank-you for this opportunity to comment. Additional comments will be forthcoming as necessary.

Russell W. Busch
Russell W. Busch
Attorney
Elwha Klallam Tribe

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RESPONSES TO ELWHA KLALLAM TRIBE

EKT-189: Regarding Item 1. Additional surveys to locate the original river channels are necessary. In Lake Mills the original river channel location is shown on the pre-reservoir maps and on the Mausolf and applicant bathymetric profiles in th middle and lower reservoir areas. The Lake Aldwell delta applicant survey sl several old channels. In the middle and lower reservoir the old channel locati also apparent.

EKT-189: The staff has modified the mortality estimate (see Appendix B, Section B.1.1.! The staff has also recommended further testing to help define final opening.

EKT-190: The staff has allowed for some additional mortality effects (see Appendix B). However, the long-term and short-term tests conducted on coho did not indica significant differences even without additional protection proposed by the appl Therefore, substantial additional mortality above those measured is unlikely.

EKT-191: Text has been added to Appendix B.2.2.

COMMENTS OF ENVIRONMENTAL PROTECTION AGENCY

RESPONSES TO ENVIRONMENTAL PROTECTION AGENCY

Agency

Seattle WA 98101

Oregon
Washington

EPA

REPLY TO
ATTN OF: WD-126

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street N.E.
Washington D.C. 20426

Dear Ms. Cashell:

The Environmental Protection Agency (EPA) has reviewed the draft Environmental Impact Statement (EIS) prepared by the Federal Energy Regulatory Commission (FERC) for the **Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington.** Our review was conducted in accordance with the National Environmental Policy Act (NEPA) and our responsibilities under Section 309 of the Clean Air Act (CAA). Section 309 of the CAA requires EPA to review and comment in writing on the acceptability of potential environmental effects resulting from actions evaluated in other Federal agencies' EISs.

The draft EIS evaluates the environmental consequences associated with the relicensing of the Glines Canyon and the initial licensing of the Elwha hydroelectric projects located on the Elwha River in Washington state. The draft EIS has evaluated four alternatives: retention of both dams, removal of both dams, removal of only Elwha dam, and removal of only Glines Canyon dam. James River II, Inc. (the applicant) has submitted an application to FERC for the licensing of the two dams. The applicant's proposal includes the retention of both dams with considerable modification of project operations and installation of new facilities to provide increased potential for anadromous salmon and trout restoration.

The scope and depth of analysis provided by FERC staff should be acknowledged and commended. The EIS evaluates a wide variety of effects including natural resource benefits, economic costs, as well as project specific impacts.

The affected area includes the Elwha River Basin on Washington's Olympic Peninsula and the near-shore coastal areas extending east of the Elwha delta to Ediz Hook. The upper portions of the Elwha River Basin are contained within the Olympic National Park (ONP) and "represents some of the most outstanding scenic and ecological resources in the United States." The park has been designated a World Biosphere Reserve and a World Heritage Park by United Nations Educational Scientific and Cultural Organization (UNESCO).

This proposed action presents FERC with a unique set of conditions that are not likely to be found in other locations where licensing and relicensing decisions are pending. These unique conditions include:

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- Wilderness, World Biosphere Reserve, and World Heritage Park designations
- the significant historic anadromous fishery values (and opportunity costs associated with the dam retention alternatives)
- the national and international importance of ONP and restored Elwha fisheries and the economic contributions they provide
- the compatibility of land management practices in the ONP, specifically wilderness management, with the fisheries restoration objective
- the consistency of the two dam removal alternative with other federal agency goals and objectives
- the superiority of the two dam removal alternative in meeting overall FERC resource objectives (p. 5-4)
- the limited number of users of the power that is produced by the two dams
- the approximate economic parity of the two dam removal alternative to the various dam retention alternatives.

The draft EIS evaluation of these four alternatives was made relative to three primary resource objectives developed on the basis of comments received during the scoping process. The resource objectives include:

- Restoration of wild, self-sustaining runs of anadromous fish
- Restoration of natural conditions within the ONP
- Provision of renewable hydroelectric energy.

EPA-1

While the one dam removal alternatives combined with FERC recommended mitigation would address some of the fishery issues, neither of these alternatives would fully address restoration of ONP's natural environmental conditions which is one of FERC's three principal resource objectives. Just as importantly, the one dam retention alternatives would not fully address restoration of wild anadromous fish production which is a second FERC resource objective. Specifically, all of the dam retention alternatives would decrease the chances for restoration of both pink and chum salmon runs, major historic components of the Elwha River anadromous fishery. The opportunity costs of not fully restoring these runs are not just the lost fishery but also the lost biomass production and lost ecosystem function in the park.

EPA-2

All four alternatives propose measures that could potentially restore various aspects of the river ecosystem. However, based on consistency with the goals of the Clean Water Act, historical and present ecological resources, the national and international significance of the Elwha's scenic and ecological resources, the potential to fully restore a valuable watershed ecosystem, consistency with relevant comprehensive management plans, consistency with

EPA-1: **Comment noted.**

EPA-2: **Position noted.**

3

EPA-2 cont'd objectives developed through the scoping process, and the opportunity to monitor and evaluate a long-term stream restoration project, EPA believes that removal of both the Elwha and Glines Canyon dams is the environmentally preferable alternative. EPA supports the removal of both dams and urges the Commission to consider selection of this alternative as the preferred alternative.

EPA-3 Based on our review, we are rating the two dam removal alternative EC-2 (Environmental Concerns - Insufficient Information). Our environmental concerns are based on the potential impacts to the drinking water source for the city of Port Angeles. We are rating the three dam retention alternatives EO-2 (Environmental Objections - Insufficient Information). Our environmental objections are based on the potential for significant environmental degradation if the dams are left in place. The dam retention alternatives do not allow full restoration of the ecological resources and ecosystem functions. Elwha River anadromous fish runs are depleted and retention of the dams will contribute to further decline of these stocks. Hatchery fish could also contribute to the decline of native coho salmon. Additional information is needed on mitigation, restoration goals, monitoring, wetlands, and water quality/quantity. Our detailed review comments are enclosed. An explanation of the EPA rating system for draft EISs is enclosed for your reference. This rating and a summary of these comments will be published in the Federal Register.

We appreciate the opportunity to review and provide comments on this draft EIS. If you have any questions about our comments you may contact Sally Brough in our Environmental Evaluation Branch at (206) 442-4012 or (FTS) 399-4012.

Sincerely,

Robert S. Burd
Director, Water Division

Enclosure

EPA-3: **Ratings noted.**

STAFF REPORT

COMMENTS OF ENVIRONMENTAL PROTECTION AGENCY

ENVIRONMENTAL PROTECTION AGENCY
DETAILED REVIEW COMMENTS
GLINES CANYON AND ELWHA HYDROELECTRIC PROJECTS DRAFT EIS

Status of the Elwha River Ecosystem

The upper portion of the Elwha River Basin are contained within the Olympic National Park (ONP) and "represents some of the most outstanding scenic and ecological resources in the United States". The park has been designated a World Biosphere Reserve and a World Heritage Park by UNESCO. The World Biosphere Reserve designation was made in recognition of the undisturbed characteristics of the park ecosystem. The World Heritage Park designation recognizes the natural beauty of the park. The portion of the watershed and river upstream from the Glines Canyon dam and reservoir and within the park boundaries is in pristine condition. The ONP that encompass the upper watershed of the Elwha River was designated as wilderness in 1988, thus assuring the continued protection of the watershed and river.

EPA-4

In the past, the primary environmental attribute of the Elwha River drainage system was the historic runs of anadromous fish (spring, summer, and winter chinook salmon; coho salmon; pink salmon; chum salmon; and possibly sockeye salmon, as well as, summer and winter steelhead trout; cutthroat trout; and Dolly Varden char). Today, Elwha River fall chinook and coho salmon are supported largely through hatchery production. Owing to dam construction, other historical runs are either extinct or highly depleted. Anadromous fish use of the river is limited to the lower 4.9 river miles below the Elwha Dam. Fisheries habitat is greatly depleted and inaccessible to anadromous species.

In addition to extensive alterations to anadromous and resident fish populations, the river ecosystem below the dams has been altered. Dam installation has retarded natural sediment and erosion conditions, thereby depleting sediment quantities within the system. These alterations, in turn, lead to changes in substrate quality, gravel bar and in-stream habitat formation, channel formation, large organic debris (LOD) quality and quantity, riparian zone viability, and water quantity and quality (temperature, nutrient load, dissolved oxygen).

Status of the Elwha River Anadromous Fishery

The American Fisheries Society (AFS) has recently published an article that lists depleted Pacific salmon stocks (Nehlsen et al. 1991). The list includes Elwha River spring chinook salmon, coho salmon, chum salmon, and pink salmon. The AFS document identifies all four stocks of salmon as populations at high risk of extinction. The spring chinook and chum salmon may have already become extinct based on the data reviewed by the authors. Decline in Elwha River native stocks was attributed to "the present or threatened destruction, modification, or curtailment of its habitat or range". (In addition to habitat damage, this category includes mainstem passage and flow problems, and predation during reservoir passage). "In addition, coho salmon were identified as having a high probability of introgression with hatchery stocks."

RESPONSES TO ENVIRONMENTAL PROTECTION AGENCY

EPA-4: The information on the Elwha River ecosystem and anadromous stocks is noted. The Commission staff has consulted with the mentioned agencies.

2

EPA-4 cont'd

The conclusions in the AFS publication are based on existing data from state and Federal agencies with jurisdiction for regulating and managing fish populations. The findings have a bearing on the selection of a preferred alternative in the final EIS. We recommend that FERC coordinate closely with the National Marine Fisheries Service and the Washington Departments of Fisheries and Wildlife in the preparation of the final EIS and development of a mitigation plan.

Hatchery Impacts

Recent studies (Emlen 1990) have indicated that artificial production alone cannot sustain anadromous stocks, and may actually contribute to the decline of native salmon populations. Hatchery production has been implicated in native population declines through hybridization and introgression (expression of deleterious and lethal genes), competition, disease, and overharvest in mixed stock fisheries. Pacific salmon are highly adapted to local environmental conditions with individual stocks maintaining unique sets of characteristics that increase individual and population fitness.

EPA-5

Replacement of current hatchery production by natural propagation should be a primary goal. The Northwest Power planning Council, Pacific Fishery Management Council, Pacific Salmon Commission, and the National Park Service consistently stress the need for re-establishment of wild, self-sustaining stocks as their first priority. Furthermore, the agencies have stated that restoration of wild stocks is incompatible with hatchery based mitigation (letter from the Joint Fish and Wildlife Agencies, National Oceanic and Atmospheric Administration, Seattle, WA, February 27, 1990). Salmonid stocks are highly adapted to their specific environments. Therefore, native stocks should be allowed to repopulate the Elwha River system.

Natural straying and repopulation of rivers has been described following natural disasters. It may prove very interesting to study the incidence of straying and rate of repopulation within the Elwha River system. However, if non-native stocks are to be transferred to the Elwha River system, they should not be taken from depleted salmonid stocks. This strategy does not provide a remedy. A detailed plan of salmonid restoration including selection criteria for non-native stock transfers should be provided to fisheries agencies and included in the final EIS. In addition, staff recommendations should be incorporated into the fish restoration plan.

Suggested Mitigation

EPA-6

If the dam removal alternative is selected EPA would like to suggest that FERC consider the formation of an oversight committee comprised of federal, state, and local experts in fisheries, wildlife, stream, and wetland ecology, as well as technical engineering personnel to coordinate dam removal activities. Utilizing adaptive management principles, the committee could document study objectives, oversee monitoring and evaluation strategies, disseminate scientific information, maintain a data bank, and evaluate study methods and objectives according to project findings.

EPA-5: **The staff has stated that the goal of restoration is to produce wild native stocks. However, Elwha River hatchery stocks might be the best source of stocks for restoration (see Sections 1.4 and 4.1.3.2 and Appendix A, Part 3.3).**

The staff does not believe it is appropriate for the Commission to designate the criteria for stock selection for the fisheries agencies at this time; therefore, in the case of dam retention the staff has not included it in the EIS. These details can be determined after licensing. The staff has developed a general restoration plan for dam removal that includes some stock selection. Without agency input to this document, the staff does not believe the stocks would necessarily be selected (Appendix A, Part 3 3). The agencies' input into this plan was requested, but they have not responded substantially.

EPA-6: **Suggestion noted.**

EPA-7 A construction schedule sensitive to the life history events of potentially affected organisms should be drafted to evaluate appropriate mitigation during construction periods. Additionally, spawning and rearing areas in proximity to construction location should be mapped and provided in the final EIS. Mitigation plans should accompany this information.

EPA-8 Water temperature in the middle and lower reaches is expected to decrease with dam removal. As stream morphology (e.g., depth, width) is reshaped in response to an increased sediment load, water temperatures may be further altered. Temperature changes can lead to compressed or protracted incubation periods and loss of synchronization to invertebrate hatch. However, increased nutrient load including particulate organic matter may increase invertebrate production and increase fry lengths and weights. To monitor temperature and other abiotic effects on salmonid populations, life history and habitat data (e.g., weight, length, and survival of eggs, alevin, and fry; species distribution; and habitat locations) should be collected. Lastly, temperature can influence inter and intra-species competitive success. Monitoring of these parameters is imperative to evaluate project success and future project designs.

Under the applicant's proposal, a mitigation plan to offset increased summer month temperatures and decreased dissolved oxygen within the mid reaches of the river should be provided.

Restoration Concerns

EPA-9 Production and long-term maintenance of in-stream habitat is a primary concern. It is imperative that natural sediment and erosion patterns and LOD retention be restored if in-stream habitat is to be created and maintained. Without habitat restoration, indigenous anadromous and resident fish populations, as well as riparian zone dependent organisms will not be fully re-established. The three removal alternatives would restore to varying degrees the natural sediment and LOD budgets. Only the two dam removal alternatives would restore the Elwha River to a biologically diverse and productive system. In addition, a natural sediment budget will enhance coastal area productivity and stabilize Ediz Hook. As a shift in intertidal substrate occurs, shellfish habitat and production may increase.

Restoration of currently inundated areas could provide an opportunity for restoration of lowland wildlife habitat and cross-valley migratory routes. In addition, highly productive and valuable riffle/pool segments would be restored to these river segments. The two dam removal alternative would restore habitat currently inundated by Elwha and Glines Canyon Dam, as well as Aldwell and Mills Lake. Furthermore, dam removal will provide access to a number of tributaries located above Elwha Dam. Tributaries not only provide increased spawning and rearing habitat, but they may play an important role in behavioral thermoregulation and disease resistance.

Monitoring

EPA-10 Regardless of the alternative selected, long-term monitoring plans should be included. Monitoring should be coordinated by a multi-agency oversight committee (see recommendation for an oversight committee). Monitoring plans should include species

EPA-7: The recommended detailed information is not needed for evaluating impacts. The entire river area within and below the dam and reservoir removal area would be affected, so all stocks in these areas would be similarly affected. The staff has expanded the discussion of the impacts to these areas, but differences in sediment and impacts to different site-specific locations cannot be predicted, so site-specific utilization information would be of no substantial additional use in evaluating the impacts.

Mitigation of impacts during construction are included in Sections 4.2.2.3 and 4.2.3.3.

EPA-8: The detailed studies proposed for dam removal could be included in the future at the request of agencies but is not needed in the EIS. The staff does not believe these studies are essential to an initial restoration plan for this option. The primary emphasis of a restoration plan would be to protect native salmon and trout stocks and to increase and ensure their introduction into the upper watershed. These primary issues have been included in the plan developed by the staff (Appendix A, Part 3.3).

For dam retention, changes in the middle reach temperature will be minor, less than 1°C average increase, with no increase in maximum temperature during the late summer (see Sections 4.1.2.2 and 4.1.2.3). Dissolved oxygen changes would be minor, short term, and local (no lower than 6 mg/l for 0.5 mile below the Glines Canyon turbine discharge during late summer, Section 4.1.2.2). The overall effect on aquatic organisms would be minor at worse and would not require mitigation.

EPA-9: Comments noted.

EPA-10: Some funding has been included for monitoring either plan. The details of the plans can be developed after licensing. The staff does not foresee that all items listed by EPA would be essential for successfully restoring anadromous fish stocks.

EPA-10 cont'd distribution, channel morphology, habitat usage, substrate structure, water quality and quantity (including temperature, dissolved oxygen, pathogen load, and nutrient level), groundwater quality and quantity, wetland hydrology, etc.

Wetlands

EPA-11 A map of wetland acreage, type, and function should be provided for review including riparian wetland habitat. All wetlands to be impacted on or off-site should be identified and appropriate review pursuant to Section 404 of the Clean Water Act should be conducted. Every attempt should be made to avoid both short and long-term impacts to wetland areas. An alternate location for concrete rubble storage should be located. Detailed description of the applicant's wildlife enhancement plan is required to determine wetland impacts. Proposed wetland mitigation projects should be documented in greater detail including detailed planting lists and project diagrams.

EPA-12 Brush and other debris accumulated during enhancement projects should not be stored in wetlands or watercourses. Areas for dredge spoil and debris disposal should be included in the final EIS.

EPA-13 A detailed vegetation/planting list should be included in the final EIS. A map should be provided indicating current land usage and habitat types; areas to be affected by both short and long-term alteration; and proposed mitigation.

Water Quality/Water Quantity

EPA-14 Dam drawdown effects and spill quantities should be discussed in greater detail in the final EIS. Supportive data should be submitted for review.

EPA-15 Comprehensive water management plans should be agreed upon by all water users. If the dams are removed and flow can no longer be controlled, water use plans stipulating withdraw schedules and quantities should be implemented to protect aquatic resources. In-stream flow requirements should be established for the Elwha River.

EPA-16 The lower portions of the Elwha River serve as the drinking water source for the city of Port Angeles. Dam removal could result in water quality problems which would affect the river's use for drinking water. The final EIS needs to provide a more detailed discussion of the effects of dam removal on water quality and mitigation measures that would be available to prevent any disruption to the city's use of the river for drinking water purposes.

Project Economics

EPA-17 The economic/financial analysis prepared for this draft EIS is a credible analysis. One might argue about detail (e.g., pricing conventions, use of gross costs rather than net costs for comparison purposes) but EPA cannot conceive that any reasonable reworking of the numbers would alter the essential conclusions.

EPA-11: Section 3.5.1 provides a description of the acreage, type, locations, and functions of the wetlands in the study area. Maps were not included in the DEIS because of the size of the study area and the large scale required to show the wetlands.

The applicant's proposal would not impact the existing wetlands. However, the applicant proposes to create a wetland on a slide area along Lake Aldwell. The staff has added a recommendation to Section 4.1.4.1 that involves development of a detailed plan for this project in conjunction with the EPA, WDW, and WDOE. This plan would be required to provide for the adequate disposal of any dredge spoil materials and presumably would include planting lists and project diagrams.

Because of the uncertainties involving dam removal, it is not possible to identify impacts to specific wetlands at this time. A staff recommendation for a wetlands delineation prior to any dam removal activities has been added to Sections 4.2.4.1, 4.3.4.1 and 4.4.4.1. The results of these delineations would be used to identify any wetlands likely to be impacted by removal activities, loss of the reservoirs, or increased lateral erosion along the river. In addition, developing wetlands along the river through the reservoir areas would be monitored on a periodic basis. Regardless of the alternative selected every attempt will be made to avoid impacts to wetlands.

Disposal of the concrete rubble from the project is not expected to impact the wetland at the Kelly Mountain site. However, a staff recommendation to identify alternative means for rubble disposal has been added to Section 4.2.4.1.

EPA-12: Section 4.1.4.2 has been modified to include a staff recommendation that the applicant find an alternative means of disposing the brush generated from their wildlife improvement plan.

Sections 4.2.4.1, 4.3.4.1, and 4.4.4.1 include estimates of the areas required for debris disposal from the dam removal alternatives. No dredged material is expected from any of the alternatives.

COMMENTS OF ENVIRONMENTAL PROTECTION AGENCY

RESPONSES TO ENVIRONMENTAL PROTECTION AGENCY

EPA-13: Lists of species for planting are usually part of detailed revegetation or improvement plans but are generally not included in EISs Sections 4.1.4.1, 4.2.4.1, 4.3 4.1, and 4.4.4.1 include staff recommendations for the development of detailed revegetation, habitat improvement, and wetland creation plans that include species lists, use of native materials, stocking rate, etc. In addition, Section 3.1.3 of Appendix A includes some specific information on the plan for revegetating the sediment disposal terraces in the reservoir areas for the dam removal alternatives

Section 3.5.1 provides a description of the current amount and types of habitats in the study area. Section 3.6 describes current land use patterns in and around the study area. Sections 4.1.4.1, 4.2.4.1, 4.3 4 1, and 4.4.4.1 include estimates of the amounts (and percent) of each habitat expected to be impacted by each of the alternatives under consideration and proposed mitigation or improvement plans. A habitat map was not included because of the size of the study area and the scale required to adequately depict the various types.

EPA-14: The discussion of effects of spill on downstream water quality have been expanded (see Sections 4.1.2.2 and 4.1.2.3).

The major effects of drawdown on water quality are the changes in temperature and dissolved oxygen below Glines Canyon dam. These factors have been described in Section 4.1.2.2.

The only other water quality parameter of significance that might change would be turbidity. However, turbidity is unlikely to change substantially from existing conditions or be elevated with the drawdown proposed by the applicant Currently the reservoir typically undergoes drawdown several times annually in the range of 2 to 5 feet, and infrequently undergoes drawdown of 10 feet (usually less than once per year). At the request of the agencies, the applicant has proposed to continue to operate the reservoirs in this mode with the addition of drawdown in low-flow years during the late summer. Historical turbidity data measurements in the river below Glines Canyon are typically less than 5 NTU's (USGS water quality data at the McDonald gage; Table 3-5 in main text). Higher turbidity levels appear to correlate with high discharge, not drawdown, although the staff was unable to find measurements definitely corresponding to 10-foot drawdown. It is possible that a 10-foot drawdown in the summer would increase turbidity from delta and bank erosion. Because drawdown is fairly common at least in the upper 5 feet, and would occur only for short periods, the increased turbidity is likely to be small and have no significant effects on the reservoir and middle reach beyond what typically occurs.

The staff-proposed alternative would reduce drawdown to the periods of late summer in low-flow years This would reduce turbidity except during these periods. However, the overall change in turbidity from the applicant's proposal would be small because most high turbidity is a function of high flow, not drawdown.

EPA-15: These recommended water management plans are not included as part of the EIS. The water management plans, outside of the release from the reservoirs, is not under control of the Commission and cannot be directed in this EIS. These plans would more likely be directed by state agencies (e.g., Washington Department of Ecology). The staff-recommended plan for flow is run-of-river, so any downstream flow needs concerning withdrawal must be established by the state agencies that control water rights and instream flow, not the Commission. Since the projects would have no control over the flow as run-of-river operations, establishing instream flow needs for aquatic resources is not a concern of these projects because they would not be altering the flow quantity. The only deviation from this would be if resource agencies requested late summer, low-flow augmentation to protect lower river fish stocks. Since these flows are for specifically supplying important resource protection, the staff does not believe the applicant needs to conduct additional studies to establish general instream flow requirements.

EPA-16: Comment noted. Sections 4.2.2.1 through 4.2.2.3 provides a more detailed description of effects of dam removal on water quality and proposes mitigation measures to address these effects Impacts to the City's water supply are expected to be minimal because the river sediments surrounding the City's Ranney collectors provide natural filtration. Slight increases in turbidity and bacteria would be expected because of the entrainment of extremely fine sediments and dissolved organic matter in the City's Ranney collection facilities. These increases would require chlorination of water used for drinking; the costs for this is included in project cost estimates described in Appendix A. A drinking water quality monitoring program, which would be required by the Washington State Department of Health under the dam removal alternatives, is also described in Section 4.2.2.3.

EPA-17: Agreement noted.

COMMENTS OF FRIENDS INSISTING ON SALMON HABITAT

Friends Insisting on Salmon Habitat
512 N. 68th Street
Seattle, Washington 98103

June 27, 1991

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, DC 20426.

re: Projects No. 588 (Glines Canyon); 2683 (Elwha).

Friends Insisting On Salmon Habitat (FISH) submits the following comments in response to the Draft Environmental Impact Statement, dated February, 1991, issued for the above referenced projects. FISH is a nonprofit corporation organized under the laws of the State of Washington. One of the specific purposes of the corporation, as stated in its Articles of Incorporation, is to engage in all activities associated with efforts to remove the dams on the Elwha River. Members of the organization have fished in the Elwha and hiked along its banks. FISH and its members are dedicated to the preservation, maintenance, and restoration of salmon habitat throughout Washington. The continued existence of the Elwha and Glines Canyon dams adversely effects the interests of FISH and its members.

FISH submits the following comments. By this reference, FISH also incorporates the comments on the DEIS submitted by Friends of the Earth, Olympic Park Associates, Seattle Audubon Society, and the Sierra Club, et al.

I. THE ANALYSIS OF COMPARATIVE ECONOMIC COSTS FAILS TO ACCURATELY REFLECT THE ECONOMIC COSTS AND BENEFITS OF DAM REMOVAL.

FSH-1 Enhanced fish production as a result of dam removal will have a discernable economic effect on the state and local economy. One source places the value of the losses to human use of the fisheries in excess of $1.7 million annually. See Washington Wildfire, February/March 1988. Similarly, tourism as a result of the restored fishery would provide a discernable economic benefit to the local economy. The DEIS states that certain benefits of dam removal were not included in the long-term resource comparison due to the absence of generally accepted methodology for assigning dollar estimates to "nondevelopmental values such as fish production, recreational use, terrestrial resources, or aesthetics." DEIS at 2-29.

RESPONSES TO FRIENDS INSISTING ON SALMON HABITAT

FSH-1: The EIS text (Section 2.7.2) has been modified to make clear that the cost analysis is purposefully limited in scope and must be considered alongside the rest of the EIS which describes the environmental improvements and adverse impacts of the various alternatives.

Secretary Lois D. Cashell
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FSH-1 cont'd

However, without consideration of these benefits, the DEIS presents a skewed economic analysis. The economic impact of restored salmon runs and enhanced recreational use of the Elwha may be roughly calculated and should be included in the comparative economic costs of the Final EIS to more realistically reflect the economic cost of allowing the dams to remain and the economic benefit of dam removal. FERC's consideration of the value of recreational use is now particularly important, as local government leaders on the Olympic Peninsula seek to diversify the local economy and reduce the peninsula economy's historic dependence on resource extractive industry.

FSH-2

The DEIS omits the savings that may accrue as a result of the return of natural sediment accretion to Ediz Hook when the dams are removed from its calculation of economic benefits, even though it discusses the erosion of Ediz Hook due to the presence of the dams. See DEIS at 3-18 to 3-20. The ongoing cost of the work done by the Army Corp of Engineers to counteract the erosion of Ediz Hook caused by dams should be considered in assessing the economic benefits of dam removal. Additionally, the return of sediments to the mouth of the Elwha will allow the Elwha tribe to resume its aquaculture in that area, because sediments will once more be deposited near the tidelands. This too will provide a discernable economic benefit.

FSH-3

The DEIS mistakenly treats the loss of power to the Daishowa America mill as an economic cost of dam removal. DEIS at 2-29, 5-22. Removing the benefit of free power to Daishowa America and its predecessors is not a true cost of dam removal because it simply takes away a free ride, rather than imposing a new cost. The fact that Daishowa America and its predecessors have been receiving apparently free power from illegal dams for the past eighty years cannot create an entitlement to that power.

FSH-4

Moreover, although Daishowa America and its predecessors have not paid for the power, that power has not been free. Rather, for the past eighty years, Daishowa and its predecessors have externalized the cost of the power to the citizens of the State of Washington, whose public resources have subsidized private corporate interests. For Daishowa America to pay for the power it uses in its pulp mill simply returns the burden of paying for power to the party using the power. FISH asks FERC to respond to the following question in its Final EIS: How does this redistribution of cost to the party benefiting from the hydroelectric power of the dams result in a new economic cost if the dams are removed?

FSH-5

Along the same lines, FISH supports Daishowa America's inclusion in the BPA industrial conservation program, but does not

FSH-2: See response CI-93.

FSH-3: The EIS treats the loss of power to the Daishowa Mill, and the associated cost increase, as an impact. It is not included in the cost analysis (Section 2.7.2). The cost analysis treats the cost to the region of replacing the foregone power at the region's avoided cost for a resource of comparable life.

FSH-4: Comment regarding externalized cost is noted. Dam removal would result in new economic costs associated with removal activities, mitigation, fish restoration, and replacement power, all of which need to be considered alongside additional restored anadromous fish runs, ecosystem restoration, and adverse impacts of removal.

FSH-5: Comment noted.

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FSH-5 cont'd believe that such participation should be based on the notion that Washington citizens owe a continuing subsidy to Daishowa America.

FSH-6 Viewed in this light, according to cost estimates in the DEIS, the cost of removing the dams is $81 million dollars (one third of $245 million). The difference in cost between dam removal and dam retention ($39) is $42 million dollars. This difference would be compensated within twenty five years of salmon restoration, if fish production is valued at $1.7 million/year. Thus, the relative costs of the alternatives are not as disparate as they appear to be in the DEIS.

FSH-7 Whether or not FERC's analysis results in different numbers than those presented here, the final EIS should include a more accurate reflection of the economic benefits of dam removal (fisheries restoration, aquaculture, tourism, recreation, and natural maintenance of Ediz Hook) and the economic costs, which do not in fact include the cost of power replacement for Daishowa America.

II. A WILDLIFE PRESERVE OR LOGGING MORATORIUM SHOULD BE INCLUDED IN THE DAM REMOVAL ALTERNATIVE.

FSH-8 An 898 acre wildlife preserve surrounding Lake Aldwell in which logging is precluded, or a logging moratorium in the Elwha watershed, should be incorporated into the alternative for removal of both dams. In the DEIS, the applicant's alternative includes a 898 acre wildlife preserve (DEIS at 4-55), while the alternative of removing both dams allows use of Elwha project lands for "timber production and management." DEIS at 4-124. In view of the sediments which temporarily may be released as a result of dam removal, a preserve on the lands surrounding Lake Aldwell in which logging is precluded will be essential to reduce the cumulative impacts of sediments on the lower reaches of the Elwha. Logging has known impacts on fish habitat as a result of increased sediments from roads, increased movement of soil in the absence of stabilizing tree root systems, and degradation of streamside vegetation which is necessary to provide cover and insects to juvenile salmon. In addition, wildlife will need areas in which to retreat from the construction work necessary while dam removal is accomplished. Stabilization of wildlife habitat should be included as an objective on par with fisheries restoration.

III. FISH SUPPORTS THE REMOVAL OF BOTH DAMS

FSH-9 Regarding the alternatives discussed in the DEIS, FISH advocates the alternative of removal of both the Elwha and Glines

FSH-6: The staff neither agrees that the cost of replacement power should be disregarded nor thinks that the decision should be based solely on dollar cost comparisons.

FSH-7: Refer to response FSH-6.

FSH-8: The staff agrees that it would be a good idea to protect the land surrounding Lake Aldwell from logging if the dams are removed. See response SOW-184.

FSH-9: Position in favor of dam removal is noted.

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FSH-9 cont'd

Canyon Dams. This is the only alternative which provides "good potential for restoring all original salmon runs, except sockeye, and good-to-excellent potential for restoring summer and winter steelhead and sea-run cutthroat and Dolly Varden trout." DEIS at 4-93. In addition, it is the only alternative which is supported by state and federal law, the only alternative which meets ALL of FERC's objectives, and the alternative which enjoys the broadest public support.

FSH-10

A. The Elwha And Glines Canyon Dams Violate State Law.

Dam removal is the only alternative which complies with the laws of the State of Washington. The Elwha Dam was illegally constructed without fish ladders in 1911, in violation of a state statute requiring fish passage devices "where food fish are wont to ascend." In addition, the State of Washington had and has a recognized legal duty to its citizens to hold this water and fishery resource in trust for public, not private, benefit. (See Illinois Central Railroad v. Illinois, 146 U.S. 387 (1892) (inception of public trust doctrine); Orion Corp v. Washington, 109 Wn.2d 621, 747 P.2d 1062 (1987) (public trust doctrine in Washington); Dahlgren v. City of Los Angeles, No. 8092 (Mono County Super. Ct. 1985) (public trust doctrine applied to fisheries). Yet, it allowed the destruction of the magnificent Elwha salmon runs for the benefit of a private power company. The construction and continuing existence of the Elwha dam and the Glines Canyon dam is a violation of the public trust. Allowing the dams to remain would also violate the policies of Washington's Shorelines Management Act, Chapter 90.58 RCW, which applies to the Elwha as a river of statewide significance.

The Elwha Dam has never been licensed by FERC, and thus seems to operate in violation of federal, as well as state, law. Similarly, the Glines Canyon Dam may be outside of FERC's licensing jurisdiction, because it is within the boundaries of Olympic National Park. Thus, it too may be operating without a valid license. As FERC is aware, the question of jurisdiction to license Glines is currently pending before the Ninth Circuit Court of Appeals.

Both dams should be removed because they were built in violation of state law, violate the public trust to this day, and may be operating without valid permits.

B. Dam Removal Is The Only Alternative Which Meets All Of FERC's Objectives Under The Federal Power Act

FSH-10: Comments on the legality of the dams are noted.

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FSH-11 The Federal Power Act authorizes FERC to issue licenses providing the project utilizes water power development, protects and enhances fish and wildlife, and serves other public uses, including recreation. Removal of both dams meets the objectives of fish and wildlife enhancement, serves other public uses such as restoration of natural conditions in Olympic National Park, and does not impede Daishowa America's ability to obtain adequate and cost effective power. Retention of one or both of the dams is totally contrary to the goal of fish and wildlife enhancement. Thus, removal of both dams is the alternative which best serves the goals of the Federal Power Act.

FSH-12 In addition, removal of both dams is the only alternative which allows for rehabilitation of the Elwha Tribe's sacred sites and its traditional method of providing sustenance for its people.

C. Removal Of Both Dams Enjoys Broad Public Support

FSH-13 Dam removal has long enjoyed the support of persons who place primary value the health of Washington's ecosystems. That support base has significantly expanded. Both of Seattle's newspapers, neither of which is known for its radical environmentalism, have advocated removal of both the Elwha and Glines Canyon Dams. See Seattle Post-Intelligencer, Wednesday, July 18, 1990 at A-6; Seattle Times, Wednesday, April 25, 1990 at A-6; Seattle Times, Sunday, April 22, 1990 at A-22. To date, at least three federal agencies have supported removal of the dams, including the General Accounting Office, National Park Service, and Fish and Wildlife Service. See Seattle Times, Friday March 30, 1990 at A-1; Seattle Post-Intelligencer, Wednesday, March 28, 1990 at B-3; Seattle Times, Thursday, July 26, 1990 at B-5; Seattle Times, Thursday, July 26, 1990 at B-5. Numerous opinion leaders have spoken out in favor of dam removal. See, e.g., Transcript of Dan Evans' Commentaries concerning the Elwha Dams, aired Thursday, July 5, 1990, and Thursday, April 5, 1991.

The reason for this public support may stem from the increasing awareness of how the world is truly diminished as ecosystems succumb to the stresses which humanity increasingly imposes upon them. The Elwha dams present an incredible and unique opportunity to not only stave off further damage but, for a change, to actually reverse the process and restore ecosystem balance. Because that ecosystem exists almost entirely within a national park, it has an excellent prospect for recovery. If the dams are removed, future generations may have the opportunity to witness one hundred pound Chinook tyee thrashing their way fifty miles up the wild Elwha as they complete their extraordinary life cycle.

FSH-11: Comment noted.

FSH-12: Comment noted.

FSH-13: The summary of public opinion and your position in favor of dam removal are noted.

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Removal of both dams should be the recommended alternative in the FEIS.

Submitted By,

Carrie Miller

Carrie Miller, President
Friends Insisting on Salmon Habitat

COMMENTS OF ITT RAYONIER, INC.

ITT

ITT Rayonier Inc.

Port Angeles Pulp Division

700 N. Ennis, P.O. Box 191
Port Angeles, WA 98362
Telephone (206) 457-3391

June 26, 1991

Federal Energy Regulatory Commission
Attention: Lois D. Cashell
825 North Capital Street NE
Washington D.C. 20426

Re: Draft Environmental Impact Statement
Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683)
Hydroelectric Projects

Dear Sirs:

ITT-1

Attached is an analysis of the water quality impacts of removing the Elwha dams and an estimated cost of treatment system additions that would be required for the industrial water system. ITT Rayonier and Daishowa America retained CH_2M Hill to perform this study because of concerns that this issue had not been adequately considered in the DEIS prepared on dam removal. CH_2M Hill's analysis confirms our concerns that removal of the Elwha dams would result in a significant increase in suspended solids concentration that would exceed the water treatment capabilities of existing facilities.

ITT Rayonier's Port Angeles Pulp Division has been producing high-purity, specialty pulps since the early 1930's. The largest end use of our pulps is the manufacture of cellulose acetate which goes into products like photographic film, yarns, fabrics, high-impact plastics and cigarette filters. These pulps are chemically pure cellulose and are required to meet stringent quality specifications to satisfy our customers needs. Clean, fresh water is a critical raw material in the pulping and bleaching process. The quality of water provided from the industrial water system combined with the capabilities of the water treatment system at the mill have allowed Port Angeles Division to meet these necessary quality specifications. If the Elwha dams are not removed no modifications to water treatment facilities are anticipated.

RESPONSES TO ITT RAYONIER, INC.

ITT-1: Staff agrees with the commentor's observation of the need to maintain the level of water quality for the City of Port Angeles and for ITT Rayonier and Daishowa America. Furthermore, after additional review of the proposed method of maintaining water quality under the dam removal alternatives, staff has concluded that the proposed method and subsequent cost presented in the DEIS are insufficient. Staff concurs that the products produced by the pulp industry could not be sustained without an adequate water supply and that the lack of such a supply could lead to the loss of these important industries and their attendant work force and economic contribution to the Port Angeles area. Consequently, staff has carefully reviewed alternatives for maintaining water quality under the dam removal alternative, including the assessment that was performed by CH2M HILL for ITT Rayonier and Daishowa America. While staff generally concurs that the commentor's proposal and cost of implementation and operation would maintain the existing water supply, there is no indication that other alternatives were addressed under the CH2M HILL assessment. Staff has reviewed other alternatives and has adopted a plan which would maintain the quantity and water quality required by the city and industry, but at a lesser cost than that suggested by the commentor. Section 4.2.2.3 provides revised text on the methodology which staff would recommend for water quality enhancement under the dam removal option. This method employs the use of a series of Ranney well collectors similar to that which provides the present water supply to the City of Port Angeles. The cost of implementing the plan has been included as part of the mitigation package for the dam removal alternative (Appendix A, Table A-27), and would not have to be paid by ITT Rayonier or other water users.

Hydroelectric Projects
Page 2

The CH_2M Hill study indicates that removal of the Elwha dams would increase the typical loading of suspended solids in the river by approximately 2500 percent. This would overwhelm the capabilities of the water treatment facilities requiring expensive modifications or new facilities. The capital and operating costs of these new facilities are estimated to be approximately $25 million and $2 million per year respectively for ITT Rayonier and Daishowa.

ITT-1 cont'd The current and projected economics of Rayonier's Port Angeles Pulp Division cannot absorb the cost of the new treatment facilities that dam removal would require. We compete in the world market with nearly 75 percent of our product exported. We are already in a cost/price squeeze as a result of reductions in federal timber harvests to protect Spotted Owl habitat. The Port Angeles Pulp Division is forecasting a pre-tax loss in excess of $10 million in 1991. If the Elwha dams are removed funding must be provided to build and operate the new water treatment facilities identified in the attached study. Failure to address this impact of dam removal could jeopardize the economic viability of Rayonier's pulp mill, our 420 direct employees and the $57 million contribution this facility makes to the economy of the north Olympic Peninsula.

Sincerely,

Jeff P. Rosbach
General Manager

Attachment

CH2M HILL
Engineers
Planners
Economists
Scientists

June 24, 1991

SEA32082.A0

Mr. Brian Jones
Environmental Superintendent
ITT Rayonier Inc.
Port Angeles Pulp Division
P.O. Box 191
Port Angeles, WA 98362

Mr. Dean M. Reed
Engineering Manager
Daishowa America
Port Angeles Mill
P.O. Box 271
Port Angeles, WA 98362

Dear Brian and Dean:

Subject: Impacts on the ITT Rayonier and Daishowa Pulp Mill Water Treatment Systems due to the Elwha River Dams Removal

EXECUTIVE SUMMARY

This letter report summarizes CH2M HILL's investigation of water treatment requirements if the Elwha River dams are removed. Two alternatives were analyzed -- modification of water treatment facilities at each mill and a single treatment facility near the river water intake. For both alternatives, a dedicated landfill for solids disposal was sized.

Modifications to Existing Water Treatment Systems

If the mill treatment systems are modified, a new flocculation and settling basin and a solids dewatering system would be added to the ITT Rayonier facility. At the Daishowa mill, the existing settling basin would be modified to allow automatic withdrawal of settled solids, and a solids dewatering system would be added. Area requirements for the added systems would be about 2 acres at ITT Rayonier and 2,000 square feet at Daishowa. According to plant personnel, this amount of area is not available adjacent to the existing treatment systems.

A single landfill would be constructed for solids disposal from both mills. The landfill would be double-lined with a leachate collection system. Leachate from the landfill would be collected at the landfill site and treated for metals removal prior to discharge. The estimated leachate volume is an average of 20,000 gallons per day with peak storm volumes in excess of 250,000 gallons per day. Assuming a 20 year minimum life, the landfill area required is about 42 acres, including a 2-acre leachate collection pond (double-lined).

CH2M HILL Seattle Office 777 108th Avenue, N.E., Bellevue, Washington
P.O. Box 91500, Bellevue, Washington 98009-2050 206 453 5000

Messrs. Jones and Reed
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June 24, 1991
SEA32082.A0

Estimated capital costs for the modifications are summarized in Table 1. Total estimated capital costs are $12.9 million at ITT Rayonier and $2.2 million at Daishowa. In addition to these costs, the estimated cost of the new landfill, including leachate collection and treatment, is $9.3 million. These costs do not include the cost of purchasing land.

TABLE 1
CAPITAL AND O&M COST SUMMARY

CAPITAL COSTS ($1,000)	ITT RAYONIER	DAISHOWA	BOTH MILLS TOGETHER	TREATMENT SYSTEM AT RIVER
SOLIDS SETTLING AND DEWATERING	12,900	2,200	15,100	16,500
LANDFILL AND LEACHATE TREATMENT	—	—	9,300	9,300
LAND PURCHASE[a]	Undefined cost	Undefined cost	Undefined cost	Undefined cost
TOTAL PROJECT COSTS	12,900	2,200	24,400	25,800
O&M COSTS[b] ($1,000/YEAR)	1,685	535	2,240	2,425

[a] Costs for purchase of land to expand mill treatment systems and for the landfill would be significant. Because the landfill location has not been determined and because of the variability in land costs, these costs were not estimated for this evaluation.
[b] For in-mill treatment, the costs shown are increased costs above current O&M costs. Leachate treatment and solids transfer costs are included.

The estimated increase in yearly O&M costs is $1.7 million per year at ITT Rayonier and $500,000 per year at Daishowa. Of the total increase of $2.2 million per year for both mills together, over a third is due to the cost of hauling solids to the landfill.

MWDW:Letter\jones-reed II

New Treatment Facility Near the River Intake

The new facility located near the river intake would consist of alum addition followed by flocculation and solids settling in a settling basin. Solids would be pumped from the settling basin to a solids dewatering facility, consisting of a solids thickener and belt presses. Area requirement would be about 2.5 acres.

A landfill with an area of about 42 acres would be required for solids disposal, assuming a 20 year minimum life. The landfill construction would be identical to the landfill that would be used if both mills modified their water treatment systems.

Estimated capital costs and O&M costs for the new facility are compared to the plant modification costs in Table 1. Total estimated capital costs for the treatment facility are $16.5 million. For the new landfill, including leachate collection and treatment, the estimated capital cost is $9.3 million. Estimated O&M costs are $2.4 million per year; of this amount, over one-third is due to the cost of hauling solids to the landfill.

Alternatives Comparison

Given the accuracy of the cost estimates, both alternatives have equal capital and O&M costs.

Although costs are equal, a single treatment system near the river intake has significant advantages over modification of the existing water treatment systems at the mills. These advantages include:

- The water pipeline to the mills would be protected against siltation that could occur during low flow periods (if one or both mills were shut down for maintenance, for example).

- If process upsets occur at the new treatment system, the mill's existing treatment systems could polish the water flowing to the mills. If treatment is done only at the mills, no backup treatment would exist.

- The new treatment facility could be used to pretreat water for the City of Port Angeles. If so, economy of scale could reduce the overall cost of water treatment for the mills and City combined.

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COMMENTS OF ITT RAYONIER, INC.

Based on this comparison, a single treatment system near the river intake would be a better selection if the dams are removed.

BACKGROUND

ITT-2 In a relicensing proceeding, the Federal Energy Regulatory Commission (FERC) has examined removal of the two dams on the Elwha River in an attempt to reestablish wild salmon runs in the river and upstream tributaries. Removal of the dams would be an alternative to licensing the dams and continuing to use them for power production. FERC completed a draft environmental impact statement (DEIS) that discusses the environmental impact of dam removal and also the impact of leaving the dams in place. The DEIS recognized that river water quality would be diminished due to increased suspended solids concentration during and after dam removal. However, a thorough investigation into the affect of the diminished water quality on the City of Port Angeles and the ITT Rayonier and Daishowa pulp mills, which draw their water supply from the Elwha River, was not provided in the DEIS.

In order to evaluate water quality impacts thoroughly, CH2M HILL was contracted by ITT Rayonier and Daishowa to investigate the affect of the diminished water quality on their water treatment systems. This investigation focused on treatment system improvements that would have to be made to meet the treated water quality requirements of the mills. Capital costs, operating and maintenance (O&M) costs, and area requirements were determined for two - alternatives - a single water treatment system near the river water intake, and modification to the mill water treatment systems. In addition, because of a significant increase in solids removed from the raw water, requirements for a dedicated solids disposal landfill were also developed.

ITT-3 The analysis presented in this report has been limited by the amount of information available on the water quality of the Elwha River if the dams are removed. Conclusions reached, however, confirm significant impact on the operation of each mill resulting from removing the dams. It is clear that the analysis of these impacts included within the DEIS did not fully recognize the water quality concerns or potential financial impacts of the dam removal proposed.

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ITT-2: Comment noted. See revised text in Sections 4.2.2.1 through 4.2.2.3.

ITT-3: Water quality data are sufficient to determine the impact on water quality resulting from removal of the dams. Conclusions reached from the assessment of the dam removal alternative are that, with appropriate mitigation, water quality can be maintained for the city and industries. The FEIS adopts a reasonable solution as presented in Section 4.2.2.3. Refer also to response ITT-1.

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RIVER WATER QUALITY

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The present suspended solids concentration (TSS) in the river water supply to the mills is determined daily by ITT Rayonier from 24-hour composite samples. Daily TSS concentrations from January 1, 1990 through March 31, 1991 were used to determine the frequency of occurrence at various TSS concentrations. These results are shown in Table 2. TSS levels are less than 15 mg/l about 80 percent of the time and less than 100 mg/l about 95 percent of the time.

The expected TSS concentration during and after dam removal was discussed in the DEIS in Section 4.2.2.1 (construction impacts on water quantity and quality). The dam removal period would last for 5 years, and water quality impacts could be expected for another 5 years after dam removal. TSS concentrations of 300 to 500 mg/l are expected to occur throughout the summer construction period (an 8-month period from March through October). These TSS levels are also expected during winter storm events, which would occur on an estimated 35 days during the winter months. The expected TSS concentrations are compared to current levels in Table 2. This comparison shows that increased TSS levels will be substantial.

The DEIS also mentions TSS levels in Section 4.2.1.1 (construction impacts on river morphology). TSS concentrations of 7,000 to 14,000 mg/l could be expected when upstream river banks slump into the river. For this evaluation, the expected TSS levels shown in Table 2 were used as a daily average. It was assumed that the much higher TSS concentrations resulting from slumping would occur intermittently for short periods of less than a day.

After 10 years (including the 5 year dam removal period), sediment load in the river is expected to decrease to levels typical of rivers in the area. Quantitative estimates of TSS concentration were not made in the DEIS. However, the expected sediment load at the mouth of the river was estimated to be an average of 209,000 cubic yards per year (Section 4.2.1.2, long-term impacts on river morphology). At an average flow of 1,506 cfs, this sediment load is equivalent to a TSS concentration of about 150 mg/l, which is about one-half of the expected TSS concentration during the dam removal period. Because much of the sediment load would occur during storm periods, peak TSS concentrations would be much greater than the average.

Although lower in the long term than during dam removal, the river TSS concentration would still be at levels that would require continued treatment by new or modified water treatment facilities. Therefore, the use of temporary treatment facilities, which would be operated only during dam removal and the 5-year period after dam removal, was assumed to be infeasible.

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ITT-4: Text observations and interpretations of concentrations are noted. The dam removal schedule has been reduced to that presented in Figures A-29 and A-32. Staff concurs with conclusions that temporary treatment facilities would be inappropriate.

Subsurface waters would have TSS values that are extremely low compared to the values cited in this analysis. For this reason, the staff has proposed that water quality mitigation under the dam removal alternative include new subsurface water collection facilities rather than the current surface water diversion facilities (Section 4.2.2.3). This would provide water with low TSS for industrial users during and following the dam removal period. The staff assumes that current surface water diversion facilities could be used after TSS levels in the river decline to acceptable levels, 5 to 10 years after dam removal.

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TABLE 2
RAW WATER TSS CONCENTRATIONS

RAW WATER TSS CONC. (MG/L)	EXISTING WATER QUALITY		EXPECTED WATER QUALITY	
	NUMBER OF OCCURRENCES[a]	PERCENT	NUMBER OF OCCURRENCES[a]	PERCENT
0	10	2.3		
5	256	59.7		
10	50	11.7		
15	25	5.8	90[b]	25
20	15	3.5		
25	14	3.3		
50	21	4.9		
75	7	1.6		
100	9	2.1		
150	7	1.6		
200	7	1.6		
300	3	0.7		
500	2	0.5	275	75
700	1	0.2		
1,000	2	0.5		
TOTAL	429	100	365	100

[a] As an example, a measured TSS concentration of 400 mg/l would be included in the count for 500 mg/l because it is greater than 300 mg/l but less than 500 mg/l.
[b] Assumed value.

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EXISTING WATER TREATMENT SYSTEMS

The ITT Rayonier and Daishowa mills have similar water treatment systems. Pertinent data on the two treatment systems are summarized in Table 3. Both mills add alum and polymer to the raw water, settle the solids in a settling basin, and then filter the basin overflow.

TABLE 3
EXISTING MILL WATER TREATMENT SYSTEMS

	ITT RAYONIER	DAISHOWA
FLOW (MGD)	32	7.2
SETTLING BASIN RETENTION TIME (HR)	1.0	4.3
SETTLING BASIN RISE RATE (GPM/FT²)	1.8	0.4
CHEMICAL ADDITION	Yes	Yes
AUTOMATIC SOLIDS REMOVAL FROM SETTLING BASIN	No	No
FILTRATION RATE (GPM/FT²)	2.2	2.2
TARGET WATER QUALITY (MG/L)	0.015	2.5

Solids are allowed to accumulate in the settling basins and are periodically pumped out after draining the basins. The Daishowa mill removes solids only once per year, and the solids are flushed directly to the Strait of Juan de Fuca.

The ITT Rayonier mill removes solids about 2 to 3 times per year during mill shutdown periods, which occur twice per year, and sometimes between mill shutdowns. Solids are transported using tanker trucks to the ITT Rayonier landfill for disposal. Solids removed between mill shutdowns must be pumped from the settling basins while keeping them in operation because removal of one of the settling basins from service would result in unacceptable treated water quality.

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The treated water quality at the Daishowa mill typically has a TSS concentration of less than 2.5 mg/l. A TSS concentration greater than 4 mg/l may cause operating problems (plugged nozzles, for instance) in the mill and may reduce the quality of the directory paper produced by the mill. Continued exposure of machinery to high TSS concentrations accelerates wear and increases maintenance.

At ITT Rayonier, the treated water TSS concentration is usually less than 0.015 mg/l TSS. A TSS concentration above 0.05 requires extra testing of the pulp product and quite often results in lower quality and lower value pulp.

Water quality concerns at the ITT Rayonier and Daishowa mills related to product quality are discussed further in the next section.

IMPACT OF HIGH TSS LOADS ON THE EXISTING TREATMENT SYSTEMS

As was shown in Table 2, high TSS concentrations will become nearly an every day event if the dams are removed. Currently, TSS levels exceed 300 mg/l 3 or 4 days per year. During and after dam removal, this TSS level would be exceeded 275 days per year. Although both mills can respond to high TSS levels by increasing chemical addition on an interim basis, treated raw water quality will often exceed target levels during these occurrences. Prolonged operation at these high levels would likely result in unacceptable treated water quality at times.

Water quality is particularly important at the ITT Rayonier mill because they produce unique, high purity chemical cellulose pulps. These pulps are converted by ITT Rayonier's customers into products such as photographic film, plastics, yarns and filaments, food additives, filters, and adsorbent mediums. The pulps must be essentially free of metals and minerals to satisfactorily perform in these end-uses. Therefore, it is critical that the quality of all raw materials used in pulp manufacturing, including incoming water, be controlled to strict standards.

As was mentioned in the previous section, the ITT Rayonier mill currently maintains the treated water TSS concentration at an average of 0.01 mg/l year round. TSS excursions above 0.05 mg/l requires extra testing of the finished pulp and quite often results in lower quality and lower value pulp. Water with high TSS concentrations contains excessive amounts of extraneous materials, mostly silica, which produce pulps that cannot be successfully used by ITT Rayonier's customers due to one or more of the following reasons:

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- Unpredictable chemical reactions yielding inferior or unacceptable products
- Physical impurities that plug up process equipment, resulting in production losses
- Poor quality in products due to extraneous materials, including fiber weakness in yarns and cigarette filters and contamination in plastics, films, specialty papers, and food and drug additives
- Excessive wear on customers' processing equipment (particularly a problem in fluff pulping)

Although water quality requirements at the Daishowa mill are not as stringent as the ITT Rayonier mill, maintaining water quality is also vitally important in order to maintain acceptable finished paper quality. The Daishowa mill produces some of the highest-quality directory paper in North America. Daishowa has contracted with their customers to provide paper that is clean and free of dirt specks and other imperfections.

The use of full color advertising in telephone directories, which requires that the paper have a very clean appearance, is increasing. Dirt content in the water must be kept at low levels to maintain this clean appearance. Bleach is used to mask any dirt that carries through to the finished paper, and an increase in dirt content would place a greater demand on the bleaching system. A major concern is the ability of the existing bleaching operation to handle higher dirt loads. With increasing TSS concentration in the water supply, operational upsets and unacceptable paper quality would undoubtedly occur as the load on the bleaching system increases.

For these reasons, good water quality is essential at ITT Rayonier and Daishowa so that they may continue to supply the high quality pulps and directory paper required by their customers.

In addition to unacceptable water quality, the large increase in solids removed by the settling basins would make the current method of solids removal impractical. Assuming 400 mg/l TSS removal, the settling basins at ITT Rayonier would be completely full in only 7 days. If the basins are pumped out when the settled solids accumulate to a depth of 2 feet, solids would have to be pumped 144 times per year compared to 2 to 3 times per year now. At Daishowa, the settling basin would be completely full in about 28 days and would have to be pumped out 34 times per year.

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Increased solids loads would result in an increase in the frequency of filter backwashing because the TSS concentration of the settling basin effluent would increase. Currently, the filters are backwashed every two to three days with a typical influent TSS load. At this backwash frequency, the estimated average backwash volume is about 1.5 percent of the total flow or 0.6 mgd for both mills.

With increased TSS concentration, the backwash frequency and the amount of water required for backwashing will increase. Based on filter operation during November, 1990, when the raw water TSS concentration was comparable to future predicted levels, the typical backwash frequency would increase to about once every 10 hours. With this backwash frequency, the total backwash volume for both mills would be about 4.7 mgd, which is 12 percent of the raw water flowing to the mills. The increased backwash water requirement would result in increased consumption of river water of over 4 mgd. This increased consumption would be a concern primarily during the summer when river water flows are already low.
In addition to the increased backwash volume discharged, the amount of solids discharged would also increase. The weight of solids discharge would increase from about 3,800 pounds per day to 31,000 pounds per day. This large increase in solids discharged directly to the strait, untreated, may require that the existing NPDES permits for both facilities be opened and reviewed. Ecology or the EPA may require that the facilities change the manner in which backwash solids are disposed, which would significantly increase treatment costs. In addition, at ITT Rayonier, the increased solids load may cause plugging problems in the plant wastewater discharge line.

Because filtered water taken from the mill water supply tank is used for backwashing, frequent backwashing can threaten the mill water supply if the filters must be backwashed one after another. Depletion of the mill water supply has almost occurred at ITT Rayonier during past instances when TSS concentrations were at peak levels.

In addition to the increased frequency of filter backwashing, the increase in the filter influent TSS concentration could result in higher effluent TSS concentrations. Past experience at ITT Rayonier has shown that poor filtered water quality is often due to increased influent TSS concentrations.

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MODIFICATIONS TO EXISTING TREATMENT SYSTEMS TO ACCOMMODATE REDUCED WATER QUALITY

After consideration of the potential operating and permit problems caused by the increased solids load, the following modifications to the existing treatment systems were assumed necessary:

- A settling basin at ITT Rayonier with a 4-hour retention time and a rise rate of 0.5 gpm/ft^2. The basin would have automatic solids removal equipment (sludge collectors, sumps, and pumps). A rapid mix section and flocculating basin ahead of the settling basin would also be necessary.

- A solids removal system installed in the existing settling basins at Daishowa to automatically remove solids.

- For both mills, a solids dewatering system and truck loading station for offsite disposal of solids. The solids dewatering system includes a gravity thickener, thickened solids pumps, a storage tank for thickened solids, belt presses, belt press feed pumps, and a polymer system.

- Minor modification to the chemical feed systems to increase capacity.

New Equipment Sizing and Area Requirements

New equipment and tanks were sized assuming 500 mg/l raw water TSS concentration. It was also assumed that the entire plant water supply would be treated in the settling basins (some of the water to the mills is currently bypassed around the treatment system). Equipment and tank sizing is summarized in Table 4. Additional assumptions used for sizing are also shown.

Use of the existing flocculation and settling basin at ITT Rayonier in combination with new settling basins was considered. Although a detailed evaluation was not done, the layout of the existing treatment system and the size of additional settling volume would make the use of the existing flocculation and settling basins impractical if not impossible. Therefore, it was assumed that the new flocculation and settling basin would provide all solids settling for the modified facility.

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At ITT Rayonier, the area required for the new settling basin and other facilities is about 2 acres. At Daishowa, about 2,000 square feet would be required. According to mill personnel, adequate area is not available adjacent to the existing treatment systems. Purchase of land would likely be necessary, and the new facilities could be a significant distance from the existing treatment systems. Location of the new facilities some distance from the existing facilities would result in increased equipment requirements (such as transfer pumps from the new settling basin to the existing filtration system) and cost.

The size of the settling basin at ITT Rayonier could be reduced by using tube settlers to enhance settling. Based on our experience, the overall cost of a settling basin with tube settlers is about equal to the cost of a settling basin without tube settlers. If a new settling basin is added to the ITT Rayonier treatment system, the use of tube settlers should be evaluated.

TABLE 4
MODIFICATION TO MILL WATER
TREATMENT SYSTEMS

	ITT RAYONIER	DAISHOWA
FLOCCULATING BASIN (GALLONS)	880,000[a]	NOT NEEDED
SETTLING BASIN (GALLONS)	7,000,000[b]	NOT NEEDED
SOLIDS REMOVAL	INCLUDED WITH NEW SEDIMENTATION BASIN	ADDED TO EXISTING SEDIMENTATION BASIN
THICKENER DIAMETER (FEET)	50[c]	25[c]
THICKENED SOLIDS STORAGE TANK (GALLONS)	150,000[d]	35,000[d]
BELT PRESSES	4,2-METER[e]	2,1-METER[e]
POLYMER SYSTEM (LB/HOUR)	25[f]	6[f]

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- 30 minute retention time
- 4 hour retention time, 0.5 gpm/ft^2 rise rate
- 0.5 gpm/ft^2 rise rate, 1.5 percent solids from settling basin
- 16 hour storage, 10 percent solids from thickener
- 2,000 lb/hour solids per meter of belt press width, 8 hour per day operation
- 3 pound polymer per ton solids

Solids Disposal and Landfill Sizing

A dedicated landfill was sized to dispose of the additional suspended solids generated as a result of dam removal. The landfill area required was estimated based on a 20-year minimum life, 50 percent solids to disposal, and a 20-foot depth. For both mills together, the area required is 40 acres. The 20 year minimum life would occur if solids loads remained at peak levels for 20 years. Assuming the solids load decreases by one-half after 10 years, the expected life of the landfill is about 30 years.

The landfill would be constructed with a double liner and a leachate collection system. Leachate would be collected during storm events in a two-acre retention pond for subsequent treatment. Based on an active area of 10 acres, the estimated leachate volume is about 20,000 gallons per day on average (yearly basis), with peak volumes of over 250,000 gallons per day during storm events. During the winter, average leachate volume would be about average twice the yearly average or 40,000 gallons per day.

Depending on the location of the landfill, discharge of the leachate to the City of Port Angeles POTW may be possible. In this case, pretreatment of the leachate prior to discharge may be necessary. The more likely scenario is that the landfill would be a significant distance from the POTW sewer system so that onsite treatment to meet water quality criteria would be necessary prior to discharge.

Based on the estimated level of organic material in the river sediment (given in the DEIS), the organic load and resulting organic biodegradation in the landfill would be much less than what occurs in a conventional landfill. Therefore, organic and BOD concentrations in the leachate should be low. Metal concentrations, on the other hand, could be greater than a conventional landfill. Because alum would be used for sedimentation, aluminum concentrations in the leachate would require treatment. Other metals, such as iron and manganese, may also require treatment. For cost estimation, it was assumed that treatment to remove metals would be necessary and that biological treatment would not be necessary.

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If biological treatment is necessary, capital costs would be about twice the cost for metal removal only.

About 58,000 tons or 61,000 cubic yards of solids per year would be disposed of in the landfill. This volume of solids disposal would require over 6,000 truck loads per year at 10 cubic yards per truck.

Capital and O&M costs for the mill modifications were developed and are discussed in the cost section.

WATER TREATMENT NEAR THE RIVER WATER INTAKE

As an alternative to providing all raw water treatment at the mills, TSS could be removed using a new facility located near the river water intake. This facility would treat raw water for both mills to a level consistent with the current raw water quality.

The treatment system would consist of alum addition followed by a rapid mix section, a flocculation basin, and a settling basin. Solids would be automatically removed from the settling basin and dewatered using belt presses.

The use of an existing channel passing near the fish hatchery was considered for solids removal. This channel is 2,100 feet in length and 30 to 40 feet wide. Review of the raw water TSS level to the mills indicates that the channel does not routinely remove solids to low levels. The TSS concentration, as shown in Table 2, can be quite high leaving the channel, indicating that appreciable solids settling does not always occur. Therefore, it was assumed that the channel could not be used for solids settling.

Equipment and tank sizing was based on an average raw water TSS concentration of 500 mg/l. Influent flowrate was assumed to be the sum of the two mill's water requirement.

It was assumed that dewatered solids would be trucked to a landfill. Discharge of solids directly from the settling basin, which would eliminate the dewatering system, would be in violation of state water quality standards because of the aluminum and TSS load added to the river.

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The landfill area required for this alternative is the same as for both mills together. The treatment system would require an area of about 2.5 acres, primarily for the settling basin. The area requirement could be reduced by using tube settlers in the settling basin. However, the overall cost would be about the same.

The equipment and tank sizes for this alternative are summarized in Table 5. Assumptions used for sizing are also shown.

TABLE 5 NEW WATER TREATMENT SYSTEM NEAR RIVER WATER INTAKE	
FLOCCULATING BASIN (GALLONS)	1,100,000[a]
ALUM SYSTEM (LB/HOUR)	550[b]
SETTLING BASIN (GALLONS)	8,500,000[c]
THICKENER DIAMETER (FEET)	55[d]
THICKENED SOLIDS STORAGE TANK (GALLONS)	190,000[e]
BELT PRESSES	5,3-METER[f]
POLYMER SYSTEM (LB/HOUR)	40[g]

[a] 30 minute retention time
[b] 30 mg/l dosage
[c] 4 hour retention time, 0.5 gpm/ft^2 rise rate
[d] 0.5 gpm/ft^2 rise rate, 1.5 percent solids from settling basin
[e] 16 hour storage, 10 percent solids from thickener
[f] 2,000 lb/hour solids per meter of belt press width, 8 hour per day operation
[g] 3 pound polymer per ton solids

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CAPITAL AND O&M COSTS

Order-of-magnitude capital cost estimates were developed using cost curves for solids handling (AWWA Handbook of Water Treatment Plant Waste Management) and CH2M HILL experience for settling and flocculation. Capital costs for each mill are compared to the capital costs for a single water treatment system near the river in Table 6. These costs include equipment purchase and installation, site preparation, engineering, contractor's costs, and administrative costs. They do not include costs for land purchase, which could significantly increase overall project costs. Given the level of accuracy of the cost estimate, the capital cost of the single treatment plant at the river is equal to the capital costs for modifications to both mill treatment systems together.

TABLE 6
TOTAL PROJECT COST
COMPARISON ($1,000)

	ITT RAYONIER	DAISHOWA	BOTH MILLS TOGETHER	TREATMENT SYSTEM AT RIVER
SOLIDS SETTLING	8,900	400	9,300	10,700
SOLIDS DEWATERING	4,000	1,800	5,800	5,800
SOLIDS DISPOSAL (LANDFILL)[a]	—	—	8,000	8,000
LEACHATE TREATMENT[b]	—	—	1,300	1,300
TOTALS	12,900	2,200	24,400	25,800

[a] Assuming solids level in the river remains high during the entire 5 year dam removal period and 5 years after the dams are removed, then solids level decreases by one-half.

[b] Assuming metals removal only. If biological treatment is required, costs would double.

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O&M costs are compared in Table 7. Assumptions used to estimate these costs are also shown. Most of the operating cost is due to chemical costs and hauling costs to transport solids to the landfill. Hauling cost depends on the distance to the landfill. Potential locations for a landfill were not determined; therefore, these costs will likely vary from those shown.

TABLE 7
O&M COSTS ($1,000/YEAR)

	ITT RAYONIER	DAISHOWA	BOTH MILLS TOGETHER	TREATMENT AT RIVER
CHEMICALS	430[a]	150[a]	580	800[b]
MAINTENANCE[c]	260	40	300	300
LABOR	190[d]	190[d]	380	350[e]
POWER[f]	8	2	10	10
SOLIDS DISPOSAL[g]	760	155	915	915
LEACHATE TREATMENT[h]	40	10	50	50
TOTAL	1,690	550	2,240	2,425

[a] Increased chemical costs over current cost
[b] Chemical use at the mills may be reduced with water treatment at the river. If so, the net chemical cost (future minus current) would be less than the value shown.
[c] 2 percent of capital cost per year (new equipment only)
[d] 14 mandays per week added to existing labor, $30/hour
[e] 28 mandays per week, $30/hour
[f] Added power costs for new equipment, $0.04/kwh
[g] 20 mile round trip to landfill, $15/cy solids
[h] $6 per 1,000 gallons leachate

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ALTERNATIVES COMPARISON

Treatment near the river and modification of both mill's treatment systems would cost about the same in capital and O&M costs.

Although about equal in cost, treatment near the river has significant advantages over modified treatment at the mills. One advantage is that the pipeline from the river to the mills would be protected against siltation resulting from the additional solids in the raw water supply. Although siltation is not likely during normal flow, low flow that would occur when one or both mills are down for maintenance could result in significant siltation. Accumulation of solids in the pipeline could lead to reduced flow to the mills, requiring maintenance or modification of the pipeline. Since the mills would have to be down during pipeline modification, pulping operations could be severely affected.

In addition to protection against pipeline siltation, treatment near the river would reduce the risk of unacceptable water quality at the mills. If an upset conditions occurs at the river treatment plant, the existing mill treatment systems would be able to further polish the water flowing to the mills. If treatment is done only at the mills, no backup treatment would exist.

Another potential advantage of a facility located near the river is that the facility could also be used to produce partially treated water for the City of Port Angeles. The City could then further treat the water using filtration to meet the City's domestic water requirements. Although this alternative has not been fully analyzed, there are potential economies of scale should the City determine that filtration would be necessary for their domestic water supply.

ITT-5 | Based on this comparison, a single treatment system near the river would be a better selection for necessary water treatment if the dams are removed.

Sincerely,

CH2M HILL

Mark W. Davis

Mark W. Davis, P.E.

cc: Harry E. Grant/Riddel, Williams, Bullitt, and Walkinshaw
Norm Ward/CH2M HILL
Don Wright/CH2M HILL
Bob Rosain/CH2M HILL

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ITT-5: In the context of the study that was performed by the commentor, the conclusion that a single treatment facility near the river would be preferable under the dam removal option is appropriate. However, staff review of all viable alternatives has lead to its conclusion that a Ranney well system as described in Section 4.2.2.3 of the FEIS is preferable under the dam removal option.

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF HYDROPOWER LICENSING

PROPOSED ELWHA (FERC NO. 2683)
AND GLINES CANYON (FERC NO. 588)
HYDROELECTRIC PROJECTS,
WASHINGTON

ITT RAYONIER INC.'S
COMMENTS ON FERC'S FEBRUARY 1991
DRAFT ENVIRONMENTAL IMPACT STATEMENT

January 31, 1992

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RESPONSES TO ITT RAYONIER INC.

I. INTRODUCTION

ITT Rayonier Inc. ("Rayonier" or the "Company"), a forest products company, engages in the production and sale of pulp, chemicals, logs, lumber, timber stumpage and land. Rayonier's Port Angeles Pulp Division, located in the City of Port Angeles, Washington, produces high-purity, specialty pulps, as it has since the early 1930s. The pulp mill draws its water from the Elwha River downstream from the Glines Canyon and Elwha Hydroelectric Projects. The largest end use of the pulps manufactured in Port Angeles is the production of cellulose acetate, a component of goods such as photographic films, yarns, fabrics, high-impact plastics, cigarette filters and food additives. These pulps are composed of chemically pure cellulose and are required to meet stringent specifications. It is, therefore, critical that the quality of all raw materials used in the Company's pulp manufacturing process comply with strict standards.[1]

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1 The Company's strict adherence to internally developed raw material specifications is essential to ensure its ability to produce pulp that meets its finished pulp specifications. Finished pulp specifications are developed through the joint effort of Rayonier and its customers. Finished pulp specifications include limitations on impurities that are impacted by water quality, such as silica, ash, calcium and iron.

Clean, fresh water is an essential raw material in Rayonier's pulping and bleaching process. The quality of water provided from the City of Port Angeles's industrial water system combined with the capabilities of a water treatment facility located at the Company's mill have allowed the Port Angeles Pulp Division to meet the necessary water quality specifications.[2] The water quality of the Elwha River, the source of Port Angeles's water supply, is currently rated very high by the State of Washington.[3] That water quality is threatened, however, by the dam removal alternatives discussed in the Draft Environmental Impact Statement ("DEIS") prepared by the staff of the Federal Energy Regulatory Commission ("FERC" or the "Commission") in connection with the above-referenced license applications.

ITT-6

Rayonier has not taken a position either in favor of, or in opposition to, the removal of the dams on the Elwha River. Rayonier, however, could not support any dam removal alternative that fails to address adequately

2 The current targeted filtered water specification for suspended materials is .01 parts per million ("ppm"). The maximum suspended material allowed by specification is .05 ppm.

3 The water quality of the Elwha River today is comparable to what it was in 1929, when Rayonier's predecessor, Olympic Forest Products Company, built the Port Angeles pulp mill.

ITT-6: Comment noted. Sections 4.2.2.1 and 4.2.2.2 describe impacts to water quality and violations of state water quality criteria under the dam removal alternatives.

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and to provide mitigation measures for the water supply and water quality impacts on the Company and others, and that fails to establish clearly the financial responsibilities for those measures. In that regard, the DEIS does not include, analyze and specify adequate mitigation for all the environmental and economic impacts relating to the water supply and water quality of the Elwha River. Without a revised and supplemented DEIS addressing these matters, any Commission decision in favor of dam removal would be both irresponsible and unlawful. See generally Niagara Mohawk Power Corp. (Niagara Mohawk Power II), 4 Fed. Energy Reg. Comm'n Rep. (CCH) ¶ 61,209 (1978) (describing "unanticipated consequences" of removal of the Fort Edward Dam on the Hudson River in New York).

ITT-7

ITT-8

The Commission staff's dam removal plan, contained in the DEIS (DEIS, pp. 4-74 to 4-138, App. A, pp. A-43 to A-61) is not sufficient to allow the Commission to evaluate and determine the measures necessary to mitigate the water supply and water quality impacts of dam removal. In fact, the DEIS states that the plan "would not by itself stabilize any of the reservoir sediment." (DEIS, p. 4-84.) It would be necessary to develop "detailed plans, specifications, and contracts for grading, drainage, erosion, sediment control, revegetation and near-term maintenance."

ITT-9

ITT-7: Section 4.2.2.3 describes a staff-recommended mitigation plan which was designed to minimize impacts in water quality to residential and industrial users of Elwha River water. The costs of this mitigation plan are provided in Appendix A.

ITT-8: The Commission looks to the FEIS, not the DEIS, as a major consideration in its decision. All comments on the DEIS have been reviewed and evaluated, and necessary changes have been made in the FEIS.

ITT-9: The FEIS dam removal plan has been refined based on DEIS comments. Impacts of dam removal can be forecasted, within reasonable bounds of certainty, and EIS Sections 4.2, 4.3, and 4.4 describe those impacts. Any "detailed plans, specifications, and contracts" would not be expected to change the staff's forecast of impacts.

ITT-9 (DEIS, p. 4-84.)[4] Without such plans, specifications and contracts, it is not possible to evaluate the dam removal plan in order to determine the magnitude of the adverse impacts on downstream water supplies and water quality.

Furthermore, in its preliminary findings, the FERC staff states that the dam removal plan involves "technical challenges of a high order, . . . very substantial adverse impacts during and immediately after [dam] removal" and "extremely high costs." (DEIS, p. 5-25.) The staff goes on to find that: "While a specific plan has been formulated that is deemed representative of the lower impact approaches to dam removal, technical uncertainties exist which could lead to more disruptive or more costly options." (DEIS, pp. 5-25 to 5-26.) Among the particular engineering concerns noted by the staff is "the stability of the silt component of the reservoir sediments." (DEIS, p. 5-26.)

While Rayonier does not necessarily concur with all other aspects of the DEIS, its comments focus on the

[4] According to the DEIS, the dam removal plan is no more than "the staff-formulated approach to dam removal." (DEIS, App. A, p. A-43.) "As described, the plans [for removal of the dams] are considered by staff as reasonable approximations of actual dam removal programs. Only through additional detailed geotechnical investigations, however, can a final removal plan be formulated." Id.

water supply and water quality impacts of the dam removal alternatives because adoption of those alternatives would significantly affect the Company's ability to continue operations at its Port Angeles Pulp Division.[5] Rayonier submits that those portions of the DEIS dealing with water supply, water quality and related issues are legally insufficient to support the dam removal alternatives and must, therefore, be revised and supplemented before those alternatives may be considered further by the Commission. Specifically, the DEIS must be revised and supplemented in the following

ITT-10 ways:

A. The DEIS must sufficiently describe and evaluate the dam removal plan to enable the commission to conclude that it is workable;

B. The DEIS must take into account the serious sedimentation effects of dam removal and the resulting adverse impacts on water supplies;

C. The DEIS must evaluate the application of federal and state laws protecting water quality to its dam removal plan;

D. The DEIS must consider the mitigation which would be required, in advance of dam removal, to address the adverse impacts on downstream water quality;

5 While Rayonier is concerned about the impact of all three dam removal alternatives, and its comments relate to those three alternatives, the focus of these comments is on the alternative that provides for the removal of both dams.

ITT-10: The portions of the EIS dealing with water supply, water quality, and related issues have been revised in keeping with DEIS comments and additional staff analysis.

ITT-10

E. The DEIS must take into account the full costs associated with maintaining water quality under the dam removal alternatives; and

F. The DEIS must evaluate financial responsibility for maintaining water quality under the dam removal alternatives.

Each of these points will be discussed in turn, following a brief description of Rayonier and its importance to the community and to the economy of the City of Port Angeles.

II. RAYONIER

A. The Company

Rayonier is a forest products company with annual sales in 1990 of more than $1.1 billion. Rayonier currently owns and operates four pulp mills: one in Georgia, one in Florida and two in the state of Washington, including the mill in the City of Port Angeles. Rayonier is the world's leading producer of high purity chemical cellulose, commonly referred to as acetate pulp, used for the manufacture of acetate yarns, cellulose plastics and filters. Rayonier has 3,100 employees serving customers in more than 60 countries. More than 50 percent of the Company's sales are in the export market.

Rayonier is also the managing general partner of a publicly traded limited partnership, Rayonier

Timberlands, L.P., which owns approximately 1.26 million acres of timberland.

B. The Port Angeles Pulp Division

The pulp mill, which is now Rayonier's Port Angeles Pulp Division, was originally constructed in 1930 by Rayonier's predecessor, the Olympic Forest Products Company. In 1937 Olympic Forest Products Company merged with two other companies owning pulp mills at Shelton and Hoquiam, Washington to form Rayonier Incorporated. One of those companies, the Rainier Pulp and Paper Company, which owned the pulp mill at Shelton, was the pioneer in the development of high purity chemical cellulose for the manufacture of rayon. The Port Angeles Pulp Division began producing chemical cellulose in 1933. Rayonier Incorporated was acquired by ITT Corporation in 1968.

1. Products

The Port Angeles Pulp Division produces the full range of Rayonier's pulp products, from the high purity acetate pulps, to viscose pulps for the manufacture of rayon, to fluff and specialty pulps. However, it is the acetate pulps that are the most important, representing approximately 70 percent of the Port Angeles Pulp Division's 150,000 air dry metric tons of annual production.

2. Competition (International and Domestic)

Rayonier's Port Angeles Pulp Division competes in the international marketplace with approximately three-fourths of its production sold in export markets. The Port Angeles Pulp Division faces international competition from mills in Canada, Scandinavia and South Africa. Domestic mills that compete with the Port Angeles Pulp Division in the chemical cellulose market include Rayonier's mills in Fernandina Beach, Florida and Jesup, Georgia; International Paper Company's mill in Natchez, Mississippi; Weyerhaeuser's mill in Cosmopolis, Washington; Louisiana Pacific's mill in Ketchikan, Alaska; and Alaska Lumber and Pulp Company's mill in Sitka, Alaska.

3. Jobs

Rayonier's Port Angeles Pulp Division is the largest private employer in Clallam County, Washington with approximately 430 employees, of which approximately 350 are members of Locals 155 and 730 of the Association of Western Pulp and Paper Workers. Salaries, wages and benefits provided to direct employees of Rayonier's Port Angeles Pulp Division exceeded $22 million in 1991.

The number of indirect jobs dependent upon the Port Angeles Pulp Division is estimated to be nearly 1,300 based on factors developed for the "Forest

Products Economic Impact Study" published in March 1991 by Richard Conway of Dick Conway & Associates, Glen Pascall of Perkins Columbia Inc. and Doug Pedersen of Security Pacific Bank.

4. Amount Of Local Sales And Property Taxes

Rayonier's Port Angeles Pulp Division pays in excess of $603 thousand per year in property taxes, $250 thousand per year in city utility taxes and approximately $700 thousand per year in sales, business and occupation taxes.

5. Purchase Of Local Resources

Annual expenditures of Rayonier's Port Angeles Pulp Division exceed $110 million, excluding capital investment (approximately $8 million per year), pulp freight expense (over $10 million per year) and overhead expenses for administration, marketing, research and development. Over half of these expenditures -- $57 million -- are made in Clallam County with wood fiber, labor, electrical energy and purchased goods and services as the major elements. Nearly all of the $110 million is spent in the Pacific Northwest.

C. The Importance Of Water Quality

Rayonier's Port Angeles Pulp Division's high standards for water quality are critical to the manufacture of chemical cellulose. Higher levels of

dissolved or suspended contaminants in the water would adversely affect both the chemical and physical performance of pulp in its customers' processes.

Contamination of chemical cellulose pulps with suspended particles would adversely affect their physical processing. Acetate and viscose yarns for textiles and filters are made by extruding dissolved cellulose through fine holes. These holes are typically less than 50 microns (i.e., 50 millionths of a meter) across. Even extremely small particles can plug these holes, causing the strand to break or compromising the quality of the final product. These suspended particles are also unacceptable contaminants in the cellulose plastics, photographic films and food and drug additives for which the Port Angeles Pulp Division's pulp is used. While the various pulp grades and their end uses are diverse and complex, the need for high quality water to produce the types of chemical cellulose required by the Port Angeles Pulp Division's customers is consistent.

In addition, calcium and magnesium, dissolved ions in water commonly referred to as hardness, act as contaminants in the acetate customers' processes. Rayonier's Port Angeles Pulp Division routinely removes these ions using water softeners to control their concentration in pulp to low and consistent levels. The industrial water supply currently has relatively low

levels of hardness. Increased water hardness, however, could overwhelm the capacity of the mill's water softeners.

The Port Angeles Pulp Division produces unique, high purity, customer-specific pulps. The mill design and equipment reflects the special requirements of serving this niche market. The technical expertise, proprietary technology and focus on quality necessary to compete in this market has been developed by the Port Angeles Pulp Division as well as by Rayonier's research and development division and its technical marketing group over the Company's long history in this field. For these reasons, as well as the size and age of the mill, the Port Angeles Pulp Division would not be a competitive producer of commodity pulps. A change in water quality that would preclude the production of the high quality chemical cellulose currently produced by the mill would be disastrous to the economics of Port Angeles Pulp Division.

III. COMMENTS ON DEIS

The National Environmental Policy Act ("NEPA") provides that all federal agencies shall

> include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed

statement by the responsible official on --

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4332(2)(C).

The Council on Environmental Quality ("CEQ") regulations, 40 C.F.R. § 1502.9(a), provide that a DEIS must to the fullest extent possible fulfill and satisfy the requirements established for final environmental impact statements, as set forth in Section 102(2)(C) of NEPA, 42 U.S.C. § 4332(2)(C). Section 1502.9(a) further provides as follows:

> If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion. The agency shall make every effort to disclose and discuss at appropriate points in the draft statement all major points of view on the environmental impacts of the

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alternatives including the proposed action.

The CEQ regulations mandate supplements to a DEIS whenever "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c)(1)(ii). Finally, the regulations permit supplements to a DEIS when the agency determines that the purpose of NEPA will be furthered by so doing. 40 C.F.R. § 1502.9(c)(2).[6]

ITT-11 The Elwha River DEIS does not allow meaningful analysis of the water supply and water quality issues raised by the Commission staff's dam removal alternatives. Since the DEIS is so inadequate as to preclude meaningful analysis and comment on the dam removal plan, a revised DEIS must be prepared to meet the requirements of NEPA. The purposes of NEPA to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the

6 At least one party to this proceeding, the Lower Elwha Klallam Tribe, has submitted significantly different dam removal and sediment management proposals. See Summit Technology, Elwha River Dam Removal and Sediment Management Report to Lower Elwha Klallam Tribe [hereinafter Summit Technology Report] submitted with Comments of the Elwha Klallam Tribe on the Draft Environmental Impact Statement (Nov. 19, 1991). Certainly, if the FERC staff were to adopt all or portions of those proposals, it would be required to prepare a revised DEIS and to permit interested parties to analyze and comment on those dam removal proposals.

ITT-11: In the staff's view, the information presented in the DEIS provided the basis for a meaningful analysis of, and comment on, the dam removal plan. This assessment is borne out by the many references to DEIS statements of impact contained in the ITT Rayonier comments. Staff believes the ITT Rayonier DEIS comments are extremely meaningful and offer perhaps the best substantiation of DEIS adequacy in the areas of water quality and water supply impacts.

health and welfare of man, and to enrich the understanding of the ecological systems and natural resources important to the nation, see 42 U.S.C. § 4321, cannot be achieved without preparing a revised DEIS. At a minimum, the revised DEIS should address the following issues:

A. The DEIS Must Sufficiently Describe And Evaluate The Dam Removal Plan To Enable The Commission To Conclude That It Is Workable

Approximately 15 million cubic yards of sediment have accumulated in Lake Mills and Lake Aldwell, two lakes located along the Elwha River. (DEIS, App. A, pp. A-46, A-56.) The DEIS acknowledges, therefore, that "[t]he major concern with any removal scheme is the subsequent transport of sediment downstream at unusually large rates because of the existing accumulation, and aggradation or accumulation in the downstream river reach." (DEIS, App. A, p. A-46.) Despite this "major concern," the DEIS does not sufficiently describe and evaluate the dam removal plan to enable the Commission to conclude that it can be implemented and will work as described in the DEIS. For example, the FERC staff concludes that "[d]redging and grading new channels and terraces would not by itself stabilize any of the reservoir sediment." (DEIS, p. 4-84.) And, the detailed plans and specifications that would be

ITT-12

ITT-12: Comment noted.

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ITT-12 necessary to stabilize the reservoir sediments have not as yet been developed.[7]

1. The Plan

In order to store and reduce erosion of the reservoir sediments, the dam removal plan[8] provides for excavation of a stable floodway and channel through the reservoir sediments during regulated drawdowns. The excavated sediments would be stabilized within the reservoirs by placing them on existing broad, low-angle terraces along the river channel. (DEIS, App. A, Fig. A-29, A-33.) Reservoir water levels would be lowered progressively, and the excavation and terracing of sediment would be carried out in phases. According to the FERC staff, sediment would be stabilized "to the extent possible" within the existing bounds of the reservoirs. (DEIS, p. 2-20.) The DEIS states that "[a]ggressive erosion control and vegetation programs would be required to reduce surface erosion." (DEIS, p. 4-74.)

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7 Removal of the dams would also eliminate the two reservoirs and the sedimentation process which occurs in the lakes. The free flowing river again would have the capability of transporting sediment downstream.

8 The plan, one of several approaches to dam removal, is the FERC staff's preferred approach. The staff concedes that "[f]urther site investigations and analyses may necessitate modifications of the dam removal plan." (DEIS, p. 2-17.)

Near-Term Impacts. Clay and most of the silt that is suspended during lake drawdown and sediment dredging would pass through the lower (or partial) Glines Canyon reservoir and Lake Aldwell downstream to the coastal zone. The clay and silt would tend to stay fully suspended in the high gradient energetic flow in the middle of the lower Elwha River channel. (DEIS, p. 4-77.)

During the construction phase, sediment would be introduced into the river as the result of channel dredging, rapid erosion of the main channel and tributaries, and slumping of terrace material into the river. Dredging in any of the channels would stir up sand, clay and silt, with most of the clay and silt washing downstream to the coastal zone. Even during the winter seasons, when there would be no work activity in the reservoir, "erosion from the exposed terraces would be very high if substantial mulching, matting and seeding are not aggressively applied and maintained." (DEIS, pp. 4-79 to 4-80.)

The DEIS indicates that, during the period of four to ten years following dam removal, the impact of sedimentation would still be severe. In the "worst case," "sediment transport from the Lake Mills area would be similar in magnitude to the estimated sediment discharge from the upper Elwha [River] in a 2 to 5-year

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recurrence interval flood, 100,000 tons per day or 86,000 cubic yards per day." (DEIS, p. 4-81.) Under these circumstances, "[s]ediment concentrations on the order of 7,000 to 14,000 milligrams per liter could be expected." (DEIS, p. 4-81.) By contrast, for the period October 1985 to September 1986, sediment concentrations averaged 4 milligrams per liter. (DEIS, p. 3-26, Table 3-4.)

Long-Term Impacts. Long-term impacts in the Elwha River from dam removal, according to the DEIS, would include "[i]ncreased sediment loads from the natural upstream sediment supply and from construction and near-term erosion." (DEIS, p. 4-82.) The FERC staff concludes that: "Even with the best construction period design and control measures, and return of the natural upstream sediment supply after construction, increased rates of sediment supply and transport would occur leading to high sediment concentration levels far more often than at present. Modifications to the fisheries spawning channel operations, the Port Angeles industrial water supply treatment systems, and the lower Elwha set-back levee would be needed to meet present operating requirements." (DEIS, pp. 4-84 to 4-85.)

FERC Conclusions and Recommendations. Of critical importance to Rayonier are the FERC staff's statements that that aspect of the current dam removal

plan intended to stabilize the reservoir sediments is not by itself sufficient and that important elements of that part of the plan are not yet developed. The FERC staff also concludes that the "[r]eturn of the natural upstream sediment supply would impact the frequency with which civil works along the river [including industrial water supply intakes] are in jeopardy of damage." (DEIS, p. 4-84.) The staff recommends that the necessary modifications to these operations and facilities should be designed and made a part of the dam removal alternatives. (DEIS, p. 4-84.) That has not yet been done. Thus, another essential part of the dam removal alternatives of utmost importance to Rayonier is incomplete. ITT-13

Beyond the FERC staff's statements that the sediment stabilization portion of the dam removal plan is not complete in certain important respects, there are various additional reasons why it is seriously doubtful that that part of the plan would actually achieve the results as stated in the DEIS.

2. Drawdown Of Reservoir Levels

The dam removal plan does not take into account the fact that the reservoir levels will not respond as proposed in the DEIS, but, at least several times per year, and perhaps more often, will rise well above the stated levels. For example, the DEIS recognizes that ITT-14

ITT-13: See response ITT-1. In addition, although the Elwha River and groundwater in the lower part of the basin are hydraulically connected, investigations indicate that the groundwater recharge is not significantly dependent on the lower Elwha River. Furthermore, the proposed spacing of the Ranney well collectors would be such that their respective drawdown zones would not overlap.

ITT-14: See response JR-5. The revised diversion plan would prevent the occurrence of reservoir inundation.

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inundation of the reservoirs would occur during the dam removal process. The DEIS states: "Major flood events would result in increases in the reservoir level and, under the most severe conditions, use of the existing project structures to discharge inflows." (DEIS, App. A, p. A-51.)[9] (See FERC staff memorandum provided as Addendum 1 of FERC's response to James River II's request for additional information, provided in letter dated May 10, 1991 [hereinafter "FERC Staff Memorandum"].)

The FERC staff analyzed reservoir levels in response to one-year, two-year, and five-year flood events, assuming that the reservoirs were empty at the start of the flood event. The staff concluded that "it is reasonable to expect some significant fluctuations following reservoir drawdown. . . . [O]ver the removal

9 The annual discharge pattern of the Elwha River is influenced by heavy Pacific tract storms in the early winter, snowmelt during spring months, and baseflow conditions during the summer. . . . Frequency analysis of yearly peak discharges indicates that a 5,000 cfs discharge corresponds to a flood event having a 1-year return interval (Figure 3-13). A 2-year flood event, which represents bankfull flooding conditions in many rivers (Dunne and Leopold, 1978), corresponds to a discharge of approximately 13,000 cfs.

(DEIS, p. 3-21.)

period [the] Glines [Canyon reservoir] can reasonably be expected to experience fluctuations as much as 100 feet, and the Elwha Reservoir achieving an essentially full pool over the period. These significant fluctuations could occur at any time during the October-April period." (FERC Staff Memorandum.)

In addition, James River has performed an analysis which shows how the reservoir levels would respond to actual river flows over the five-year estimated construction period. James River used the dam removal plan set forth in the DEIS and an actual river flow record. (_See_ James River II, Inc., _Comments on FERC's DEIS of February 1, 1991_ App. 1 (June 28, 1991) [hereinafter "Comments of James River II"].[10] The James River analysis of reservoir levels includes results using a block of data with a 50 percent exceedance probability (in other words, flows during an actual decommissioning scheme would have a 50 percent chance of being less than these, and a 50 percent chance of being higher). According to the analysis,

> [D]uring the Year 2 construction season, things go as planned. The reservoir levels increase only slightly

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[10] Accordingly, since the sediment stabilization aspect of the plan is incomplete and will have to be developed further, and likely modified, James River must be given the opportunity to revise its analysis of the impact of reservoir levels after the plan is further developed and modified.

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> during storms over the winter. However, during the Year 3 construction season problems begin. High flows do not allow the reservoir level to get down to the desired 460 feet until late September, leaving only a few weeks for sediment handling activities. The following year is even worse, with reservoir elevations well above the Year 2 elevation of 510 throughout most of the construction season. It is December before the lake gets down to the desired 430 foot elevation, but it immediately jumps back up to elevation 570 during a flood event. Any construction activity that could take place during Year 4 would likely be attempts trying to restore conditions to the Year 2 level of stabilization. During Year 5, elevation 430 is finally reached in early October, leaving one month to do the stabilization work planned for Year 3 and 4 and to remove the dam before high flows hit again in November.

(Comments of James River II, Inc., pp. 14-15.)

ITT-15 It is obvious from the DEIS and the FERC staff and James River analyses that it would not be possible to carry out the planned sediment stabilization activities -- e.g., to implement the aggressive erosion control and vegetation programs required to control sedimentation -- during the five-year construction period. Each time the reservoir levels rise, much of the vegetation planted above those levels would die and need to be replanted. Sediment moving in from upstream would also be deposited in the previously dredged river channel at the higher reservoir elevation. ITT-16 As a result, the water quality impacts of the dam removal

ITT-15: Under the revised diversion plan, the construction period would be shortened. The success of the sediment stabilization plan would be significantly enhanced with the absence of reservoir reinundation. Refer to responses JR-5 and JR-14.

ITT-16: Sediment stabilization would be enhanced under the revised diversion plan outlined under response JR-5.

ITT-16 cont'd

alternatives would be more serious and the sediment stabilization costs would be significantly higher than the nearly $40 million noted in the DEIS. (DEIS, App. 1, Tables A-17, A-21.)

ITT-17

Dam removal also would not be accomplished during the five-year time frame specified in the DEIS.

3. Failure Of Sediment Storage Terraces

According to the DEIS, side slopes have been designed to a 4:1 slope in the sandy delta deposits and 15:1 for lake bottom silts. (DEIS, p. 4-74.)

ITT-18

The DEIS does not indicate how, and under what conditions, the FERC staff analyzed the stability of the storage terraces.[11] As indicated in the DEIS, as stated by the FERC staff and as shown in the James River analysis of reservoir levels, the reservoirs will be inundated during high-flow conditions, which are expected to occur up to several times per year during dam removal. Hence, it is reasonable to expect that the storage terraces will be submerged and saturated, and that their stability must be carefully evaluated under such conditions.

Since the DEIS does not contain the results of any analysis of the stability of the sediment storage

11 There are indications that the FERC staff analyzed the stability of the storage terraces under dry conditions and that the terraces would not be stable when wet. (Comments of James River II, Inc., p. 15.)

ITT-17: Under the revised diversion plan, dam removal would be accelerated as outlined in Appendix A.

ITT-18: Under the revised diversion plan, the storage terraces will not be subject to inundation and subsequent saturation and instability.

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terraces under the different conditions which would exist during dam removal, it is not possible to evaluate or comment on the extent of slope failures, which would increase significantly the concentrations and frequency of sediment moving through the river system. It is not possible to determine whether the erosion measures described in the DEIS would be adequate to deal with the

ITT-19 downstream water quality impacts, or whether more extensive measures would have to be employed. In addition, more frequent slope failures and the corresponding implementation of more extensive mitigation measures to deal with those failures would delay construction and extend the dam removal alternative period, and its costs, well beyond the Commission staff's estimates.

4. FERC's Sediment Stabilization Plan

In connection with its analysis of James River's proposed alternative, the Commission's staff recommends that the applicant develop and implement an erosion and sediment control plan ("ESCP") in consultation with the Washington Department of Ecology ("WDOE"), the Washington Department of Fisheries ("WDF"), the National Park Service ("NPS") and the Washington Department of Wildlife ("WDW") to limit increased suspended sediment concentrations during construction and operation of the fish passage facilities. (DEIS, p. 4-3.) In connection

ITT-19: The DEIS and expanded text in the FEIS contain recommendations for slopes and slope treatments that result from the stability analysis of reservoir sediments. The staff analysis included field measurement of the eroding delta slopes during the Lake Mills drawdown test, comparison to similar eroded deltas which are common in the region, soil tests on one lake bottom sample, and stability analysis for saturated and unsaturated conditions of typical lake bottom and delta sediment cross-sections. Final designs recommended by the staff would include site-specific stability analysis.

with its evaluation of its own dam removal alternatives, the DEIS, however, recommends only "[d]evelopment of detailed plans, specifications, and contracts for grading, drainage, erosion, sediment control, revegetation, and near-term maintenance plans . . . to stabilize the reservoir sediments." (DEIS, p. 4-84.)

ITT-20

In order to evaluate and compare the alternatives presented in the DEIS, an ESCP is needed for each alternative, including the dam removal alternatives raised by the Commission's staff. The staff should develop ESCPs for the dam removal alternatives similar to those it recommends be prepared by James River. These ESCPs should be included in the revised DEIS to allow meaningful comment on the dam removal alternatives and meaningful comparison to the alternative involving dam retention.

5. Risk Assessment Of The Plan

ITT-21

FERC must prepare a risk assessment analyzing the likelihood of the dam removal plan working as intended. Since the staff finds that removal of both dams would involve "technical challenges of a high order, . . . very substantial adverse impacts during and immediately after [dam] removal" and "extremely high costs" (DEIS, p. 5-25), it is simply not enough for the Commission's staff to assume "reasonable" performance as

ITT-20: Comparative environmental and economic evaluations necessitated the formulation of dam retention and removal plans. The plans presented for each of the dam retention and removal alternatives are considered reasonable approximations of actual dam retention and dam removal programs for assessment purposes. Adequate contingency construction options and costs are included in each alternative the staff assessed to account for unanticipated conditions (Appendix A). Final designs for the alternative that is selected are to be prepared after the licensing decision is made, as a part of the staff-recommended conditions.

ITT-21: See response JR-20.

the staff has indicated that it has done. (*See* FERC Staff Memorandum.)

ITT-21 Heavy precipitation and flooding are common events in the Pacific Northwest.[12] For example, total precipitation in Port Angeles, Washington in 1990 was 35.48 inches over 113 days. (National Climatic Data Center, Annual Climatological Summary.) During the last two winters, there have been storms which caused slope failures, stream bank erosion and flood damage throughout the Olympics and Cascades. How would these storms have affected the reservoir water levels? What effects would these storms have had on the "aggressive erosion control and vegetation programs," which are a critical part of the sediment stabilization and dam removal plan? How would these storms have contributed to slope failures? Under these circumstances, how much sediment would have been released into the river system, and what would the effects have been on downstream water quality? How would storms of this nature affect the five-year construction schedule proposed in the DEIS?

The limited experience with dam removal confirms the importance of a careful evaluation of the risks that the sediment behind the Glines Canyon and Elwha dams will not behave exactly as predicted, and the potential

12 *See supra* note 8.

impacts on downstream water quality. For example, the history of the removal of the Fort Edward Dam from the upper Hudson River, at Fort Edward, New York is instructive. There, the Federal Power Commission had authorized removal of an old, relatively small dam on the basis of a plan calling for the contractor to remove an estimated 3,200 cubic yards of silt and other material accumulated above the dam. The removal plan proved grossly inadequate, however, when, after removal of the dam, an estimated 440,000 cubic yards of material washed downstream. The unanticipated consequences of the removal were described as follows by the Presiding Administrative Law Judge who considered allegations of license violations:

> Witnesses for the United States Corps of Engineers presented the estimate that during the early part of 1974, after the removal of the Fort Edward dam, about 440,000 cubic yards of material had washed downstream. About 30,000 cubic yards had been deposited in the vicinity of the Champlain Canal Lock 7 entrance to the New York State Barge Canal system.
>
> It was represented that these downstream deposits of materials had created serious hazards, including the partial blocking of the east channel of the Hudson River and the possibility of flooding in the area of the Village and Town of Fort Edward.
>
> Large islands had been created in the river bed of the Hudson River by materials that washed downstream after the dam removal. Substantial deposits

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> of materials at a river beach site had seriously impaired the recreational utilization of this area. Sanitary problems resulted because the reduction of the level of the river had exposed sewer line outlets running into the river.
>
> Water intake facilities, including the Scott Paper inlet, had been threatened with blockage by migrating materials. This latter company had arranged for dredging along the banks of the river upstream of its water intake facilities, and had erected steel barriers near its water intake area in an effort to prevent water borne materials from blocking its water intake pipes.
>
> At the time of the inspection of this area, in the spring of 1974, it was estimated by a Corps of Engineer witness that about 1 million cubic yards of additional material was located in the former Fort Edward reservoir and that this material was also subject to possible movement downstream.

Niagara Mohawk Power Corporation (Niagara Mohawk Power I), 4 Fed. Energy Comm'n Rep. (CCH) ¶ 63,009 at 65,062 (1977).

As a result of the experience, the Commission ultimately concluded, among other things: "Any license for dam removal in the future will be drafted differently with the lessons of Fort Edward in mind." Niagara Mohawk Power II, 4 Fed. Energy Comm'n Rep. at 61,485 n.28. The Fort Edward experience, moreover, is particularly cautionary when it is recalled that the

Fort Edward Dam was a stone and timbercrib dam approximately 19 feet high, associated with a 2 megawatt power production facility, and restraining an (erroneously) estimated 3,200 cubic yards of silt and other loose material, id. at 65,061-62, whereas the Glines Canyon dam is over 200 feet high, made of concrete, and associated with a 13 megawatt power production facility, and the Elwha Dam, also made of concrete, is over 100 feet high, and associated with approximately 15 megawatts of power production capacity, and 15 million cubic yards of sediment is believed to be accumulated in Lake Mills and Lake Aldwell. Although the circumstances and the environment are different, the risks in the present situation clearly must be considered at least as great, and probably very much greater, than those presented by the Fort Edward dam removal.

ITT-22

Additionally, the history of the removal of the Sweasey Dam in Mad River, California, the only west coast case study similar to the Elwha River dam removal alternatives, casts serious doubt on, among other things, the ability to stabilize sediments in the drainage area behind the dam removal sites. The Sweasey Dam was removed from the Mad River in 1970. Since the dam's removal, the mouth of the Mad River has migrated north more than two miles. "Sediment shock," which

ITT-22: Comment noted.

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resulted from the dam's removal, has been blamed for the meandering of the river's mouth. (Why the Mad Rush?, The Times-Standard, Nov. 22, 1991.) According to the local paper: "Sudden removal of the dam washed 3,000 acre-feet of sand out of its reservoir and delivered it to the river's inlet between 1971 and 1973 . . . . This is 10 to 20 times the normal river supply, and what we see in the behavior of the river inlet today is primarily its response to this unnatural sediment shock." Id. (internal quotations omitted). As is noted in the review of the DEIS prepared by Natural Resources Consultants, Inc., researchers at Humboldt State University have compiled data that suggests that the fine sediment wave from the dam site may be exiting the lower river only now, more than 20 years following dam removal. (Review of Sweasey Dam Removal on the Mad River, California, App. 2 to Comments of James River II, Inc.)

ITT-23 Under the circumstances, the need for a risk assessment for the Elwha proposals is self-evident. Rayonier, and the interested public generally, are not in a position to evaluate the merits of the dam removal alternatives and to provide meaningful comments without the preparation by FERC's staff of a risk assessment on the dam removal plan.

ITT-23: See response JR-20.

B. The DEIS Must Take Into Account The Serious Sedimentation Effects Of Dam Removal And The Resulting Adverse Impacts On Water Supplies

Based on public, agency and intervenor comment during environmental impact statement scoping, the Commission staff identified three principal resource objectives relevant to the licensing of the Glines Canyon and Elwha hydroelectric projects. These objectives include: (1) restoration of anadromous fish production throughout the Elwha River Basin, (2) restoration of natural environmental conditions within Olympic National Park ("ONP") and (3) provision of renewable hydroelectric energy. (DEIS, p. 1-5.) Although the FERC staff recognizes that it must account for multiple aspects of the public interest, including water supply (DEIS, pp. 1-4 to 1-5), the protection of the water supply is not designated a principal resource objective and indeed receives scant attention in the DEIS.

ITT-24

As the Commission's staff recognized in its DEIS, water supply is one of the beneficial public uses FERC must consider in its licensing determinations under the Federal Power Act ("FPA"). The State of Washington rates the water of the Elwha River, its tributaries, Lake Mills and Lake Aldwell as Class AA, a classification given to surface waters having

ITT-24: Water quality and the associated effects on water supply are given extensive treatment in the EIS (29 pages in Sections 3.0 and 4.0). It receives this considerable degree of attention because the staff sees water quality and water supply issues as very important and the potential adverse impacts very significant.

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COMMENTS OF ITT RAYONIER INC.

"extraordinary" water quality. (Wash. Admin. Code § 173-201-080 (38); DEIS, p. 3-24.) Water supply and the quality of the water supply are critical to Rayonier. Poor quality water will not only clog equipment, but will result in inferior products due to unpredictable chemical reactions and the introduction of extraneous materials.

Water supply is also of critical importance to other downstream water users, including the City of Port Angeles, Daishowa America, fish hatcheries and the Dry Creek Water District. Yet, the DEIS does not enumerate water supply or water quality as a principal resource objective, and it does not weigh these issues as heavily as restoration of fisheries or restoration of the ONP ecosystem. ITT-25 Instead, the Commission staff's analysis of the water quality impacts resulting from dam removal is superficial and incomplete. Rayonier does not believe that this is appropriate balancing under the FPA.

ITT-26 Rayonier requests that the water supply, and specifically the protection of water quality, for downstream water users such as itself, the City of Port Angeles, Daishowa America, the fish hatcheries and Dry Creek Water District be included as a fourth principal

RESPONSES TO ITT RAYONIER INC.

ITT-25: A reading of EIS Section 5.6 will demonstrate that water quality impacts received equal consideration among other resource values and that the staff placed substantial weight on water quality in its recommendation.

ITT-26: The principal resource objectives were defined through the EIS scoping process, and the staff has no basis for their modification now. Nonetheless, it should be clear that water quality and water supply issues received substantial weight in the development of the staff's recommendation.

ITT-26 cont'd resource objective and weighed at least as heavily as the other criteria.[13]

1. Impact Of Dam Removal On Water Quality

According to the DEIS, "suspended sediment concentrations would be substantially increased in the Elwha River below Glines Canyon dam following drawdown of Lake Mills and Lake Aldwell, during excavation and stabilization of the river channel and each reservoir, and during periods of high flow in the late fall and early winter. Turbidity values in the river would be adversely impacted by increased suspended sediment loads." (DEIS, p. 4-85.) The DEIS acknowledges that the "[i]ncreased turbidity would have an adverse impact on industrial water supplies and a potentially adverse impact on domestic water supplies for the City of Port Angeles." (DEIS, p. 4-85.)

Near-Term Impacts. High turbidity levels would occur during the initial release of water from the diversion tunnel at Lake Mills and Lake Aldwell, during

13 If water quality was not stressed at the scoping stage, it was not because it is not important. Rayonier, like other members of the public, did not recognize at that stage the degree to which its water supply was threatened. Now that the DEIS has pointed out that the dam removal option would involve many years of violation of the state's water quality standards for the Elwha River, and has described some of the likely sediment impacts of dam removal, Rayonier is most concerned that protection of water quality for downstream users be considered a very high priority.

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initial and final drawdown of each reservoir, and during fall and winter storms immediately following each summer construction period. After removal of both dams, high concentrations of suspended sediments would be expected during winter high-flow periods.[14] Suspended sediments would be derived largely from clay and silt deposited on riverbanks and within the riverbed during the construction phase of the project. Hence, high turbidity levels would result from high suspended sediment loads during and after dam removal.

Turbidity would be adversely impacted by increased suspended sediment loads. Turbidity values of 100 to 200 NTU are predicted to occur during the dam removal period, and would change in direct proportion to suspended sediment loads. (DEIS, p. 4-88.) These turbidity levels would be significantly higher than peak turbidity values of 70 NTU currently existing in the Elwha River (USGS Water Quality Records), and would consequently violate state water quality standards.

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[14] "For winter storm events, high suspended sediment loads would be expected to occur for peak discharges exceeding 3,000 cfs. A flood event of this magnitude is equaled or exceeded 10 percent of the time on a daily basis on the Elwha River (staff analysis based on USGS Gauging [sic] Records at McDonald Bridge). (DEIS, p. 4-87.) Consequently, adverse sediment loads during the dormant seasons (October through February) of the multi-year construction period would be expected to occur for approximately 35 days per year." (DEIS, p. 4-87.)

(DEIS, p. 4-88.) State standards require that turbidity values not exceed 10 percent of natural values. (Wash. Admin. Code § 173-201-045 (1989).)[15]

These high turbidity levels, according to the DEIS, would adversely impact water diverted for use by Rayonier. (DEIS, p. 4-86.) They also would adversely impact water diverted for other industrial use and the WDF fish-rearing channel, and according to the FERC staff, could potentially impact waters diverted by the City of Port Angeles for domestic use and by the Lower Elwha Klallam Tribe for their fish hatchery. (DEIS, p. 4-86.)

Long-Term Impacts. According to the DEIS, for approximately three years following removal of Glines Canyon dam, suspended sediment concentrations would continue to remain high. Sediment concentrations would gradually decline with the stabilization of the newly developed river channel in the Lake Mills and Lake Aldwell reaches. However, the riverbanks along the middle and lower reach, in addition to the reclaimed terrace slopes of the Lake Mills and Lake Aldwell

15 Water quality would also be seriously affected by the introduction of concrete waste into the Elwha River during construction, including the installation of diversion tunnels and dam demolition. Such adverse impacts would be further aggravated by oil, diesel and chemical spills from use of heavy equipment during dam removal. (DEIS, p. 4-87.)

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reaches, would serve as a source of sediment to the river for an extended period of time. (DEIS, p. 4-90.)

The DEIS indicates that, ultimately, suspended sediment concentrations in the Lake Mills, Lake Aldwell and middle and lower reaches would be the same as those currently observed in the upper river. (DEIS, p. 4-90.) Consequently, according to the FERC staff, long-term turbidity values in the middle and lower reaches of the Elwha River after dam removal would not be significantly different from currently existing conditions. (DEIS, p. 4-90.) Despite having made this statement, the DEIS concludes: "Erosion of silt terraces in the Lake Mills and Lake Aldwell reaches during flood events could add substantially to already expected high natural silt and clay loads." (DEIS, p. 4-90.)[16]

The increased sediment loads in the Elwha River under the dam removal alternative, according to the FERC staff, would result in substantially increased water treatment costs for Rayonier and the other industrial water users. (DEIS, p. 4-91.) The DEIS further recognizes that the increased treatment costs would be

16 As noted, the long-term impacts of dam removal would include "increased rates of sediment supply and transport . . . leading to high sediment concentration levels far more often than at present." Such high sediment concentration levels would require "[m]odifications to the . . . Port Angeles industrial water supply treatment systems." (DEIS, pp. 4-84 to 4-85.)

the greatest for Rayonier's Port Angeles Pulp Division and the Daishowa America paper mill, since those two plants use a majority of the water diverted from the Elwha River for industry. Rayonier uses between 25 and 35 million gallons per day, while Daishowa America uses approximately 10 million gallons per day. Both plants treat water obtained from the Elwha River prior to use.[17] However, Rayonier has more stringent water quality requirements, and consequently a more extensive treatment facility, because its pulp is used in chemical cellulose applications. (DEIS, pp. 4-91 to 4-92.)

2. Potential Adverse Effects Of Flooding

ITT-27 The DEIS fails to consider adequately the potential for flooding connected with the dam removal alternatives. For example, in sections 4.2.1 and 4.2.2 of the DEIS, the Commission staff discusses impacts associated with the dam removal alternatives on river morphology and on water quality respectively. Neither of these sections provides an adequate analysis of the potential for flooding on the Elwha River during and subsequent to dam removal. Impacts from flooding would likely be most severe in the lower basin where both the City of Port Angeles and industrial users such as

17 In addition to the 25 to 35 million gallons of treated water that Rayonier uses per day, the Company uses approximately 10 million gallons per day of untreated water for non-process cooling and other uses.

ITT-27: See responses COE-3 and SOW-140.

ITT-27 Rayonier withdraw water from the river. Flood conditions could adversely affect both the Ranney collector used by the City of Port Angeles for its domestic water system and the industrial water diversion which delivers water to the Rayonier and Daishowa America mills. The potential adverse effects of flooding which could occur in the event of dam removal must be considered in greater detail.

3. Impact On The Industrial Watermain

ITT-28 The DEIS acknowledges that the Ranney collector could partially be blocked by high sediment loads as a result of dam removal. (DEIS, p. 4-88.) The DEIS, however, does not consider the potential adverse effects to the capacity of the city-owned industrial watermain, which is operated and maintained by Rayonier and Daishowa America, that would result from implementation of the dam removal alternatives. Flat grade and very low pressures could allow the additional sediment resulting from the dam removal alternatives to settle in the pipeline, thereby reducing capacity and increasing operating costs associated with the pipeline. Streamflow changes in the headworks in the river are also expected to have dramatic impacts on the capacity of the pipeline.

ITT-28: Under the revised plan for maintaining city and industrial water supply (Section 4.2.2.3 and Appendix A), the distribution system would be devoid of silt.

C. The DEIS Must Evaluate The Application Of Federal And State Laws Protecting Water Quality To Its Dam Removal Plan

The Commission staff recognizes that "[c]onstruction and subsequent removal of the Elwha and Glines Canyon dams would result in adverse impacts to the water quality of the Elwha River." (DEIS, p. 4-85.) For this reason, the DEIS recommends a water quality monitoring program during the five-year construction period and the three years following dam removal. (DEIS, p. 4-91.) However, the DEIS fails to evaluate in any meaningful way the application of laws governing water quality and pollution prevention, including laws that require various certifications and permits before the dams could be removed. Accordingly, the DEIS should consider application of these laws to the dam removal alternatives.

ITT-29

Section 401 of the Clean Water Act, 33 U.S.C. § 1341, requires a certification from the designated state agency that water discharges (such as those that would occur in conjunction with the dam removal alternative) comply with various provisions of the Clean Water Act. Construction and subsequent removal of the dams would result in discharge of reservoir sediments stored behind the dams into the Elwha River. (DEIS, pp. 4-86 to 4-87.) Construction impacts would likewise introduce concrete wastes into

ITT-29: Water quality sections in Section 4.0 refers to various water quality codes that would be subject to review during the final design stages of all the alternatives addressed in the DEIS.

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ITT-30 the Elwha River. (DEIS, p. 4-87.) Accordingly, any dam removal plan would be subject to certification from the State of Washington that any such discharges comply with the provisions of the Clean Water Act.

ITT-31 Another provision of the Clean Water Act prohibits the discharge of any pollutant into the navigable waters of the United States without a permit. See 33 U.S.C. § 1311(a). Accordingly, a National Pollutant Discharge Elimination System Permit ("NPDESP"), see 33 U.S.C. § 1342, would be required if it is determined that the reservoir sediments and concrete wastes that would be discharged into the Elwha River in the course of dam removal -- certainly pollutants as far as Rayonier Port Angeles Pulp Division processes are concerned -- are covered by the law.

ITT-32 Alternatively, if the reservoir sediments and/or concrete wastes are considered dredge or fill material rather than pollutants, a permit would be required under section 404 of the Clean Water Act, 33 U.S.C. § 1344(a), which requires permits for the "discharge of dredged or fill material into navigable waters at specified disposal sites." The removal of the dams would involve the discharge of excavated and dredged material into the Elwha River. Additionally, sand, concrete and other materials used in the construction of the Elwha and

ITT-30: Predicted violations of state water quality standards under the dam removal alternatives have been described in Sections 4.2.2.1 and 4.2.2.2. Requirements for state certification of construction activities with regard to Section 401 of the Clean Water Act have been addressed in response JR-63.

ITT-31: These comments have been addressed in response JR-63. The staff acknowledges that state and federal NPDES permits and a Section 404 permit may be required prior to dam removal. The applicability of the NPDES and Section 404 permit processes to dam removal is currently being reviewed by state and federal agencies.

ITT-32: See response ITT-31.

ITT-32 cont'd

Glines Canyon dams may constitute fill material. Accordingly, a section 404 permit would be required.

ITT-33

The State of Washington has established a State Waste Discharge Permit Program to regulate wastes that are not covered by the NPDESP. The DEIS fails to consider whether the removal of the dams would constitute an industrial operation and whether a Washington State Discharge Permit would be required.

D. The DEIS Must Consider The Mitigation Which Would Be Required, In Advance Of Dam Removal, To Address The Adverse Impacts On Downstream Water Quality

As indicated above, the DEIS identifies the transportation of sediment downstream, and the consequent adverse impact on water quality, as "the major concern" with any dam removal scheme. (DEIS, App. A, p. A-46.) Yet the DEIS does not give any assurance that the proposed sediment stabilization plan is, in fact, workable. The Environmental Protection Agency ("EPA") has urged that there be "a more detailed discussion of the effects of dam removal on water quality and mitigation measures that would be available to prevent any disruption to the [City of Port Angeles's] use of the river for drinking water purposes." (EPA, Detailed Review Comments, Glines Canyon & Elwha Hydroelectric Projects Draft EIS, p. 4 (attached to letter from Robert S. Burd, Director, Water

ITT-33: See response ITT-31.

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Div., EPA, to Lois D. Cashell, Secretary, FERC (June 21, 1991))). Rayonier shares EPA's concerns -- and, in particular, the concern that adequate mitigation measures be in place not merely to restore water quality after the fact, but to prevent, before the fact, any disruption of existing water uses. ITT-34

As noted, Rayonier uses between 25 and 35 million gallons of treated water per day and, due to the nature of its end products, must maintain stringent water quality standards. Rayonier currently operates a two-step water treatment facility in which water is initially subjected to polymer and alum flocculation and, afterwards, is run through a coal filter bed. This system allows Rayonier to maintain TSS concentration levels at an average of 0.01 mg/l year round. CH_2M Hill, consultants for Rayonier and Daishowa America, have confirmed that removal of the Elwha dams would result in increases in suspended solids (of as much as 2500 percent) that would exceed the water treatment capabilities of Rayonier's existing facilities.[18]

[18] CH_2M Hill, Letter Report regarding impacts on the ITT Rayonier and Daishowa Pulp Mill Water Treatment Systems due to the Elwha River Dams Removal, pp. 8-10 (June 18, 1991) [hereinafter "CH_2M Hill Report"]. The CH_2M Hill report was transmitted to the Commission under cover of a June 21, 1991 letter from Jeffrey Rosbach, General Manager of Rayonier's Port Angeles Pulp Division, to Lois Cashell. A copy of that report is also attached hereto as Exhibit 1.

ITT-34: Staff concurs.

Initial CH_2M Hill conclusions are that upgraded treatment facilities would have to be installed to preserve required water quality for the Rayonier plant -- specifically, a new flocculation and settling basin and a solids dewatering system. These water treatment facilities, which would take an estimated three years to install, would need to be in place before dam removal.[19]

These estimates, however, were constrained by limited information. As explained by CH_2M Hill:

> The analysis presented in this report has been limited by the amount of information available on the water quality of the Elwha river if the dams are removed. Conclusions reached, however, confirm significant impact on the operation of each mill resulting from removing the dams. It is clear that the analysis of these impacts included within the DEIS did not fully recognize the water quality concerns or potential financial impacts of the dam removal proposed.

(CH_2M Hill Report, p. 4.)

Given the current state of the analysis, it remains unclear whether the contemplated upgraded facilities would be adequate. The DEIS, in fact, does not provide any quantitative estimates of TSS

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19 The DEIS refers to cost estimates obtained in a telephone conversation with Rayonier's Brian Jones on October 31, 1990. (DEIS, p. 4-92.) These estimates were based on a highly preliminary understanding of the impacts of dam removal. In light of the DEIS, it is clear that, in a dam removal scenario, additional measures of the kind suggested by CH_2M Hill would be required.

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concentrations, although it acknowledges, "large amounts" of sediment will be released and "additional" treatment expenditures will be required:

> With best efforts at sediment control, removal of the dams would still release large amounts of sediment currently stored in the reservoirs. Much of the silt portion of the sediments currently stored at the bottom of the reservoirs would be released downstream during the 4- to 5-year construction period, and sporadic high levels of suspended silt loads would continue to be experienced over a period of several years after completion of the removal process. High silt loads would reduce production of fish stocks in the middle and lower river reaches and adversely affect municipal, industrial, and fish-rearing channel water supplies. Additional treatment expenditures would be necessary to allow continued use of the Elwha River as a water source during and immediately after the dam removal process. With the return of the natural upstream sediment supply after dam removal, the middle and lower reaches would experience decreased channel stability and increased potential for flood damage.

ITT-35 (DEIS, p. 5-26.) Until there is a more precise quantification of water quality impacts -- including "worst case" impacts -- it will remain unclear whether additional treatment facilities of the kind contemplated by Rayonier would be adequate to maintain required water quality standards.

Even more significantly, however, if water quality maintenance plans should be proven inadequate after dam removal has commenced, it may well be too

ITT-35: See revised text in Section 4.2.2.1 on the quality of water contemplated under the dam removal alternative.

late. Existing water uses would have been disrupted, with human and financial consequences that are potentially far in excess of what is considered in the DEIS, and that may even be irremediable. Accordingly,

ITT-36 Rayonier urges further and more detailed consideration not only of water quality impacts and water quality mitigation measures in general, but of mitigation measures that can be put in place in advance of dam removal to provide confidence that there will be no disruption of existing water uses. See generally Confederated Tribes & Bands of the Yakima Indian Nation v. FERC, 746 F.2d 466 (9th Cir. 1984) (requiring fisheries studies prior to license issuance), cert. denied, 471 U.S. 1116 (1985).[20]

ITT-37

E. The DEIS Must Take Into Account The Full Costs Associated With Maintaining Water Quality Under The Dam Removal Alternatives

The DEIS does not include water treatment costs in its summary of dam removal costs. (See DEIS, App. A, Table A-24.) The cost benefit analysis in the DEIS relies on three elements: (1) the capital cost of constructing (or removing) project facilities;

[20] The effect of dam removal on current and future water users was studied in connection with preparation of the Summit Technology Report. That Report, however, simply concludes that "[f]urther study is needed to determine appropriate measures to mitigate impacts on fish and to maintain water quality for current and future users." Id. at II-36.

ITT-36: Staff concurs (see Section 4.2.2.3).

ITT-37: See the FEIS revised cost estimate in Appendix A, Table A-27.

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(2) increases or decreases in the base operation and maintenance expenses attributable to the alternatives; and (3) the value of power generation forgone as a result of implementing the alternatives. The total incremental cost of the dam removal alternative, including value of forgoing generation, is $245 million. Capital and operating and maintenance costs would total $81 million.

The Commission staff recognizes, however, that some costs would be incurred to protect industrial water supplies under the dam removal alternatives. (DEIS, pp. 4-91 to 4-92.) As noted above, water quality impacts and related economic impacts must be analyzed by the Commission in order to develop an environmental impact statement that is adequate and in compliance with NEPA. CH_2M Hill estimates capital costs for Rayonier to maintain water quality standards at approximately $13 million, with annual operating and maintenance ("O&M") costs increasing by $1-2 million per year, and not including the costs of purchasing land and over $9 million for a new landfill and related facilities. CH_2M Hill's estimates for Daishowa America are lower, at approximately $2 million in capital costs and $500,000 in O&M increases. The total for both companies, nonetheless, is, conservatively, well in excess of $25 million in capital costs and over $2 million per

year in O&M costs. These costs, moreover, are predicated on the DEIS and the very limited information it contains concerning water quality.[21]

ITT-38 As noted above, the sediment stabilization aspect of the dam removal plan is incomplete, would need to be developed further and likely will be modified. The modifications that would be required to make the dam removal alternatives workable almost certainly would increase the project costs. Hence, the cost estimates in the DEIS would have to be revised after the development of a dam removal plan and completion of an appropriate risk assessment to ensure that the plan will work as intended, and most particularly, will mitigate the downstream water quality impacts.[22]

ITT-39 F. <u>The DEIS Must Analyze The Financial Responsibility For Maintaining Water Quality Under The Dam Removal Alternatives</u>

Finally, the DEIS does not address the specific question of who would bear the costs of maintaining water quality, or would provide compensation for the

21 CH_2M Hill has suggested an alternative approach using a single water treatment facility near the river that would treat water for multiple users, including the City of Port Angeles. This alternative, while considered preferable by CH_2M Hill, is estimated to be no less expensive.

22 These estimates also should take into account increased costs to comply with federal and state water quality laws and requirements as described above.

ITT-38: See responses JR-5, JR-20, JR-49, and JR-77.

ITT-39: The cost of maintaining the integrity of the water supply systems is included as a portion of the dam removal cost. It is the staff's intent to indicate that the entity that bears the cost of removal would also bear the cost of water supply mitigation.

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costs incurred if water quality is not maintained, under the Commission staff's dam removal alternatives. Rather, on the issue of financial responsibility, the DEIS states that the staff envisions three general implementation scenarios: a "full licensee responsibility" scenario in which the licensee bears full responsibility for implementing the Commission's decision; a "federal takeover" scenario in which, presumably, implementation costs would be borne by the federal government; and an "allocated responsibility" scenario in which federal and state governments contribute funds for "certain aspects" of the project and other costs are shared by various unidentified parties. (DEIS, p. 5-24.)

But two of the scenarios, on their faces, are implausible. As to "full licensee responsibility," the licensee, James River II, has denied any such responsibility. As to "allocated cost responsibility," the record, so far as Rayonier is aware, contains no indications of federal or state government financial commitments nor is there evidence of willingness by private entities with the necessary resources to commit themselves to the kinds of expenditures involved. Furthermore, as to the only alternative that seems realistic -- the "federal takeover" alternative -- the DEIS notes that "[t]o date, there has been no request by

a federal department or agency for federal takeover of the Glines Canyon or Elwha projects." (DEIS, p. 5-24.)[23]

ITT-40 A revised DEIS clearly must provide further analysis of this critical aspect of the case, including an analysis of the Commission's relevant legal authority.

ITT-41 Furthermore, and more generally, Rayonier submits that the costs of maintaining water quality, however calculated and however great they ultimately may be, must be considered as costs of the dam removal alternatives. The responsibility for those costs -- as well as for other costs -- must be clearly established prior to any Commission action that would require dam removal. Otherwise, any such action would threaten to create a chaotic situation, see Niagara Mohawk Power II, 4 Fed. Energy Reg. Comm'n Rep. at ¶ 61,209 (describing litigation and other unexpected consequences of Fort Edward Dam removal), and could only be characterized as arbitrary and capricious. See 5 U.S.C. § 706(2)(A).

23 It should be noted, however, that draft "federal takeover" legislation is currently under consideration in Congress and may be introduced in the current session. One such draft bill is Senator Adams' "Elwha River Ecosystem Restoration Act" which, among other things, would provide three years for a study of the feasibility of dam removal.

ITT-40: The staff does not consider the EIS as an appropriate vehicle for resolution of legal issues.

ITT-41: The staff agrees that the costs of maintaining water quality should be considered as costs of the dam removal alternatives. The FEIS has been revised accordingly.

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IV. CONCLUSION

ITT-42 As indicated at the outset, the focus of these comments has been on water quality. Wholly apart from other issues, the DEIS does not provide a basis for meaningful analysis and comment on water quality concerns associated with the dam removal alternative. Further development of that alternative will require the issuance of another DEIS.

Respectfully submitted,

ARNOLD & PORTER

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Date: January 31, 1992

ITT-42: Comment noted. It is the staff's view that ITT Rayonier's DEIS comments demonstrate that the DEIS provided a basis for meaningful analysis and comment. All DEIS comments have been considered in preparing the FEIS.

Comments on FERC's DEIS of February, 1991

Elwha Project

FERC No. 2683

Glines Canyon Project

FERC No. 588

James River II, Inc.

June 28, 1991

Prepared by Harza Northwest, Inc.

JAMES RIVER CORPORATION
WAUNA MILL
Clatskanie Oregon 97016 (503) 455 2221

June 27, 1991

Lois Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capital Street N.E.
Washington, D.C. 20426

Re: Project No. 2683 (Elwha)
Project No. 588 (Glines Canyon)
Comments on FERC's DEIS of February 1991

Dear Ms. Cashell:

On February 22, 1991, the Federal Energy Regulatory Commission made available the Draft Environmental Impact Statement on the above reference projects. At that time, comments on the DEIS were requested by April 29, 1991. By a FERC notice dated April 30, 1991, the submission date for comments was delayed until June 28, 1991. Herein, please find James River's comments on the DEIS. Copies of these comments have been distributed as indicated on the attached distribution list.

Thank you for your assistance.

Very truly yours,

R. J. Morgan

Robert J. Morgan
Vice President
James River II, Inc.

RJM/fd

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing document upon every party to this proceeding in accordance with the Commission's Rule of Practice and Procedure.

Dated at Bellevue, Washington, this 28th day of June, 1991.

Richard S Fleming

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COMMENTS ON FERC'S FEBRUARY, 1991

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Project No. 2683 (Elwha)
Project No. 588 (Glines Canyon)

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COMMENTS ON FERC'S DEIS

LIST OF ABBREVIATIONS

Applicant	-	James River II, Inc.
BPA	-	Bonneville Power Administration
COE	-	U.S. Army Corps of Engineers
DEIS	-	Draft Environmental Impact Statement
EIS	-	Environmental Impact Statement
El	-	Elevation
ESCP	-	Erosion and Sediment Control Plan
FEIS	-	Final Environmental Impact Statement
FERC	-	Federal Energy Regulatory Commission
FPA	-	Federal Power Act
FWS	-	U.S. Fish and Wildlife Service
GAO	-	Government Accounting Office
HEP	-	Habitat Evaluation Procedures
HSI	-	Habitat Suitability Index
JFWA	-	Joint Fish and Wildlife Agencies
LET	-	Lower Elwha Tribe
LPP	-	Land Protection Plan (ONP)
MSY	-	Maximum Sustained Yield
MW	-	Megawatt
MWH	-	Megawatt Hour
NEPA	-	National Environmental Policy Act
NHPA	-	National Historic Preservation Act
NPS	-	National Park Service
NPV	-	Net Present Value
NTU	-	Nephelometric Turbidity Unit
O&M	-	Operation and Maintenance
OER	-	Optimum Exploitation Rate
ONP	-	Olympic National Park
PNPTC	-	Point No Point Treaty Council
RMP	-	Resource Management Plan (ONP)
WAC	-	Washington Administrative Code
WDF	-	Washington Department of Fisheries
WDW	-	Washington Department of Wildlife

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ELWHA - GLINES CANYON PROJECTS

COMMENTS ON FERC'S DEIS

INDEX TO SPECIFIC COMMENTS

Note: This index covers only the specific comments that apply to certain issues. this entire document, including discussion, specific comments and appendices, should be considered to be James River's comments on the DEIS.

Section	Code	Topic
F	CD	Construction and Decommissioning
F	GSR	Geology, Soils, River Morphology
G	WQQ	Water Quality
H	FR	Fisheries Resources
I	TR	Terrestrial Resources
J	LU	Land Use
K	AES	Aesthetic Resources
L	SOC	Socioeconomic Resources
L	CUL	Cultural Resources

Construction and Decommission Comment	Topic	DEIS Reference, page	Applicant's Comment, page
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CD-2	Elwha, Stability of Spoil Terraces	Section 2.3.1, page 2-18	20
CD-3	Glines, Diversion Canal	Section 2.3.2, page 2-19	20
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CD-5	Glines, Construction Impacts on WQ	Section 4.2.1.1, page 4-77	21
CD-6	Glines, Construction Erosion	Section 4.2.1.1, page 4-79	21
CD-7	Glines, Erosion Control Measures	Section 4.2.1.1, pgs 4-77 to 4-80	21
CD-8	Glines, Reservoir Refilling	Section 4.2.1.1, page 4-79	22
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CD-12	Elwha, Risk Analysis	Appendix A, pages A-43 to 46	22
CD-13	Elwha, Diversion Facilities	Appendix A, pages A-43 to 46	23
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CD-18	Elwha, Capacity of Storage Terraces	Appendix A, pages A-46 to 49	25
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CD-20	Elwha, Repeated Excavation of Channel	Appendix A, pages A-46 to 49	26
CD-21	Elwha, Plant Restoration on Terraces	Appendix A, pages A-49 to 50	26
CD-22	Elwha, Removal of Facilities	Appendix A, page A-50	26
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COMMENTS OF JAMES RIVER II. INC.

RESPONSES TO JAMES RIVER II. INC.

COMMENTS OF JAMES RIVER II. INC.

A. EXECUTIVE SUMMARY

The decision regarding the future of the Elwha hydroelectric projects is an important one that will have very significant economic and environmental consequences, not only for James River (the owner of the projects) and Daishowa America (the owner of the mill where project power is used), but also for many elements of the public in Port Angeles, the Olympic Peninsula, and the Pacific Northwest. It is essential that both FERC and the public fully understand the consequences that can reasonably be expected from the two principal alternatives, licensing of the dams with fish mitigation measures, or removing the dams. Public comment, and an ultimate decision, must be based on the best information available regarding potential impacts.

Although James River has some specific comments regarding the DEIS' analysis of the dam retention (licensing) alternative, particularly with regard to fisheries issues, in general we believe the impacts and benefits of this alternative as presented in the DEIS are reasonably accurate. The dam retention alternative and its impacts are presented with adequate detail and supporting documentation to give the reviewer a fairly high degree of confidence in the projected impacts and costs. The DEIS would support a decision to license the projects.

JR-1 James River believes that the analysis of the dam removal alternative contained in the DEIS is seriously deficient and does not provide an adequate basis for a decision favoring this alternative. The deficiencies include:

- The deconstruction and sediment stabilization plan is not workable as described;
- Underestimation of the serious sedimentation effects in the lower river and the resulting adverse impacts on the existing anadromous fisheries and on municipal and industrial water supplies;
- Underestimation of costs;
- Substantial overestimation of benefits to fisheries and the economics of the Olympic Peninsula; and
- Understatement of the level of risks due to weather factors and unforeseen difficulties inherent in a project of this nature and magnitude;

JR-2 The work completed to date on the dam removal alternative, by FERC, by James River, and by downstream water users such as the City of Port Angeles and Daishowa America, has served to bring into better perspective the magnitude of such a project, its complexities, and the uncertainties involved. It is clear that dam removal would be a major undertaking having a very high cost and the potential for serious environmental impacts. James River believes that FERC should rule out the dam removal alternative based on macro-considerations of the costs vs. benefits and the risks/uncertainties involved. If, however, FERC decides to continue to include dam removal as an alternative, a great deal more work will need to be done to adequately

RESPONSES TO JAMES RIVER II. INC.

JR-1: The sedimentation effects have been further analyzed in Section 4.2.3. Fisheries benefits have also been further assessed in Section 4.2.8. The staff believes its assessment of potential risks is adequate.

JR-2: The staff notes James River II's position, but disagrees. The DEIS comments, in the staff's view, are clear evidence that meaningful analysis and comment has occurred. Further, all DEIS comments have been considered in preparing a thorough FEIS. A recent court decision (U.S. Court of Appeals, U.S. Department of Interior vs. FERC, January 10, 1992) has confirmed that the Commission has the authority to decide what studies and information are necessary for the Commission to make an informed decision.

COMMENTS OF JAMES RIVER II. INC.

JR-2 cont'd describe and analyze a viable dam removal scenario in the detail necessary to fully assess the environmental impacts and risks. James River believes that further development of the dam removal alternative will require issuance of another DEIS to fully comply with the intent of NEPA provisions. Failure to issue a revised DEIS will almost assuredly result in a legal challenge, because this draft is so insufficient as to preclude meaningful analysis and comment. See Section B.

JR-3 After thoroughly examining all the information accumulated to date regarding the two alternatives, James River remains convinced that the public interest would best be served by licensing the projects with appropriate fish mitigation measures. The potential fisheries and other environmental benefits of dam removal are highly speculative, and there is substantial evidence that dam removal may actually result in a decrease in the net present economic value of harvestable fish. James River believes any benefits of dam removal are far outweighed by the environmental and economic cost of dam removal and the loss of power from the projects.

RESPONSES TO JAMES RIVER II. INC.

JR-3: Position in favor of dam retention is noted.

B. REVISED DEIS REQUIRED FOR MEANINGFUL ANALYSIS OF THE ALTERNATIVES

JR-4 The DEIS is severely inadequate in its descriptions of the costs, benefits, and other environmental impacts of the alternatives, particularly the dam removal alternative. Because the DEIS is so inadequate as to preclude meaningful analysis and comment, a Revised DEIS must be prepared to meet the requirements of NEPA.

The process of circulating a draft EIS for review and comment is a critical element of NEPA. The applicable CEQ regulations stress that a draft statement must fulfill and satisfy "to the fullest extent possible" the requirements established for a final EIS. The importance of a draft that fully and accurately describes the alternatives and their expected impacts was clearly articulated in Appalachian Mt. Club v. Brinegar, 394 F. Supp. 105, 121-22 (D.N.H. 1975), where the court stated:

> NEPA is "at the very least a disclosure law." In order to effectuate the disclosure aspects of NEPA, the CEQ established that an EIS must undergo two stages of review.
>
> In the first stage, a draft impact statement is prepared and circulated to the public and various agencies for comments and criticism. This is the vital stage, for it is here that outside review can vitiate "objective errors or excessive bias in an EIS." This is the only time when the public and outside agencies are able to closely analyze the impact statement and their comments, provided that they are responsible, must be included in the final EIS.
>
> ...
>
> There cannot be responsible decision-making when data appears in the final EIS without being subject to the critical evaluation that occurs in the draft stage. There are two dangers that can occur when information appears in the final EIS for the first time: (1) the ultimate decision-makers will believe that there is no controversy due to the lack of critical comments; and (2) objective errors without being red-flagged would go unnoticed.... "

The court went on to invalidate the final EIS, saying,

> Supplemental information, which has not been processed in the same manner as a draft EIS, cannot resurrect a deficient impact statement. The failure to include traffic data in the draft impact statement denied the plaintiffs the "opportunity to test, assess, and evaluate the data and make an informed judgment as to the validity of the conclusions to be drawn therefrom." In addition, the absence of critical comments created the erroneous impression that there was no disagreement as to either the statistics or the conclusions.

The CEQ regulations require preparation and circulation of a supplemental draft for comment "[i]f a draft statement is so inadequate as to preclude meaningful analysis." 40 C.F.R. § 1502.9(a). The regulations also require a supplemental draft if "there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9.

JR-4: Refer to response JR-2.

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COMMENTS OF JAMES RIVER II, INC.

JR-5 A second DEIS must be produced in this case to meet the requirements of NEPA and relevant case law. The DEIS in this case is "so inadequate as to preclude meaningful analysis." As described above, the description of the dam removal option in the DEIS is merely a conceptual design, and the analysis presented in these comments demonstrates that the design is not feasible with real flows expected to occur in the Elwha River. In the absence of a feasible plan, the environmental impacts and costs of dam removal are based in large part on speculation rather than fact.

JR-6 Similarly, the assumptions of the DEIS regarding fisheries benefits from dam removal are highly speculative. The detailed analysis performed by Natural Resources Consultants (Appendix 2 of these comments) demonstrates that the benefits suggested in the DEIS are overly optimistic and not supported by evidence. Finally, as discussed in Section E, the DEIS does not fully and accurately state the need for and value of the power generated by the project, particularly the impacts of increased power cost to the Daishowa America mill in Port Angeles.

JR-7 A Revised DEIS is essential for the public to review and comment on the environmental and economic costs and benefits of the alternatives. The errors in the DEIS, particularly with regard to the sediment effects of dam removal and fisheries implications of dam removal, are such critical elements of the analysis of dam removal that they affect the entire document. Because the errors are so pervasive, it is necessary to prepare an entire new draft, rather than merely a supplement that addresses a few issues.

RESPONSES TO JAMES RIVER II, INC.

JR-5: The staff assumes that this comment relates to the interruptions that could occur during sediment stabilization in the reservoir as a result of the inability of the diversion tunnel to fully pass low frequency storm events. Inundation can be controlled by increasing the size of the diversion tunnel or through other diversion measures. The exact diversion scheme would need to be addressed in detail at the final design stage. For instance, preliminary assessment indicates that the structural integrity of each dam is such that low level adits could be constructed through each dam at a relatively low cost and risk. The staff has reviewed the diversion plan presented in the DEIS and concluded that, with slight modifications, the tunnel diversion scheme presented in the DEIS should be maintained. However, in order to ensure that the reservoirs at each project are not subjected to excessive fluctuations, portions of the dams at each project would be lowered coincident with the drafting of each reservoir. This would allow for full sediment stabilization in the reservoirs without risk of frequent inundation. In addition, the schedule for removal of features that would affect reservoir storage and sediment stabilization has been accelerated. Other options described in Appendix A would be considered at the exploration and design stage if the dam removal option alternative were implemented. See revised text in Section 4.2 and Appendix A.

JR-6: The staff acknowledges that future estimates of potential fish benefits have a degree of uncertainty, but disagree that they are "highly speculative." The NRC analysis, while containing much useful information, some of which was used in the FEIS, does not prove the staff analysis is incorrect. The staff disagrees with many of NRC's assumptions and analyses concerning potential production of the system and the potential for restoration. The staff believes sufficient evidence is available for the assessment.

JR-7: Refer to response JR-2.

C. NO ACTION ALTERNATIVE

JR-8 The DEIS does not adequately discuss the existing projects and the surrounding environment. The regulations of the Council on Environmental Quality, 40 CFR § 1502.14 (d) require the DEIS to include a discussion of the alternative of no-action. Similarly, FERC staff has recognized the need to set a baseline to evaluate relicense proposals:

> Setting a baseline
>
> To evaluate competing proposals, we need to see how the value of the developmental and nondevelopmental resources change under each proposal.
>
> We do this by setting a baseline or reference alternative - how the project now operates under all the conditions of the current license.
>
> Once we set our baseline, we can evaluate any relicense proposals by comparing the value of development and nondevelopmental resources under the proposal to their values under baseline conditions.[1]

This is consistent with congressional intent. "In exercising its responsibilities in relicensing, the conferees expect FERC to take into account existing structures and facilities in providing for these nonpower and nondevelopmental values." Conference Report, Electric Consumers Protection Act of 1986, H.R. Rep. No. 99-934, 99th Cong. 2nd Sess. 22 (1986).

JR-9 The Applicant has not proposed that FERC simply maintain the status quo and relicense the projects as they sit. However, it is essential that FERC develop baseline data on the existing projects and include a complete discussion of that information in the DEIS so that there is sufficient basis from which the relative benefits and impacts of each of the seriously considered alternatives can be evaluated. In some instances the DEIS contains description of the existing situation but fails to clearly compare the alternatives with the baseline. For example, in considering impacts to the fisheries from various proposals, it is important to note the loss of the existing hatchery based fishery and the impacts of that loss on various parties. Such comparisons are necessary throughout the document to allow the public to understand the tradeoffs involved with each alternative.

[1] Federal Energy Regulatory Commission Office of Hydro Power Licensing Paper No. DPR-2 April 1991, "Evaluating Relicense Proposals at the Federal Energy Regulatory Commission," at pp 5-6.

JR-8: A baseline representing current conditions has been clearly established in Section 3.0 and environmental impacts have been consistently determined for all alternatives with reference to the baseline.

JR-9: This has been more extensively addressed in the Socioeconomics sections.

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D. RESOURCE OBJECTIVES

The DEIS recognizes that the Federal Power Act requires FERC to account for multiple aspects of the public interest, and to weigh the relative importance of many factors, recognizing that it is a process of balancing and of tradeoffs. DEIS at 1-4, 1-5. This discussion properly suggests compromises and resolutions that recognize the importance of many factors.

However, in the selection of three "principal resource objectives", and description and application of the three, the DEIS appears to lose some of this sense of balance. James River believes two changes should be made in the principal resource objectives:

(1) "Protection of water quality for downstream water users" should be added as a fourth principal resource objective, and

(2) The second objective, "restoration of natural environmental conditions within ONP" should be seen as a continuum, rather than in absolute terms.

1. Protection of Water Quality for Downstream Water Users

JR-10

Water supply is one of the "beneficial public uses" FERC is required to consider in its licensing determinations under the Federal Power Act. Water quality on the Elwha River currently is very high, rated as AA by the State of Washington. WAC 173-201-080(38). This water quality is very important to many downstream water users, particularly the City of Port Angeles, industrial facilities including two large mills, fish hatcheries, and the Dry Creek Water Association. Yet the DEIS does not name water quality or water supply as a "principal resource objective," and it does not treat these issues as if they were as important as restoration of fisheries or restoration of the ONP ecosystem. James River does not believe this is appropriate balancing under the Federal Power Act.

The DEIS states that the principal resource objectives were selected "based on public, agency, and intervenor comment during EIS scoping." DEIS at 1-5. If water supply and water quality were not stressed at the scoping stage it was not because they are not important. It is more likely that the public did not recognize at that stage the degree to which their water supply was threatened. Now that the DEIS has pointed out that the dam removal option would involve many years of violation of the state's water quality standards for the Elwha River, and has described some of the likely sediment impacts of dam removal, protection of water quality for downstream users must be considered a very high priority.

The City of Port Angeles has requested that water supply be added as a fourth "principal resource objective and given at least equal weight to the other criteria that will ultimately be used in the EIS." James River concurs in this request.

JR-10: Refer to responses ITT-25 and ITT-26.

2. Restoration of ONP Ecosystem

The DEIS states that one of the three principal management objectives for this relicensing is the restoration of natural conditions within the Olympic National Park (ONP). DEIS, at 1-7. As the basis for this objective, the DEIS points to the 1963 report "Wildlife Management in National Parks" prepared by Secretary Udall's Advisory Board on Wildlife Management ("Advisory Board Report"). According to the DEIS, the Advisory Board Report defines NPS's management goal of preserving or, where necessary, recreating "the environment as viewed by the first European visitors." The DEIS overstates the significance of this goal as it applies to the licensing of these Projects. For the reasons discussed below, this FERC management objective must be reformulated to provide for more flexibility in achieving restoration of natural conditions in the Elwha River ecosystem.

JR-11 The most fundamental deficiency of the DEIS on this issue is that it defines ONP restoration in "all or nothing" terms. By relying on the Advisory Board Report, the DEIS suggests that NPS management policies will be frustrated unless the Elwha River drainage is restored to the conditions "witnessed by the first Europeans." In fact, NPS does not rigidly adhere to this policy objective in all circumstances. NPS management policies provide for flexibility and recognize the need in certain cases to approach ecosystem restoration from a perspective that allows varying degrees of success short of reviving pristine, primitive conditions.

For example, the Advisory Board Report itself notes that restoring the "primitive scene" cannot necessarily be done completely. See NPS, Administrative Policies, at 102 (1970) ("1970 Policies"). Limitations must be recognized, the Report observes. In instances where cost, competing resource values, and non-NPS related policy objectives intervene, the Report indicates, ecosystem restoration must be approached as a matter of degree.[2]

Moreover, even though the Advisory Board Report and its emphasis on restoring primitive conditions may be upheld as an ideal, none of the NPS plans for the ONP references the Advisory Board Report or recognizes an ecosystem restoration goal in the absolute terms called for by the DEIS for all areas of the Park or all resources. In fact, as discussed above, the ONP Master Plan and Land Protection Plan (LPP) confirm that NPS's management objectives can be met with the Glines Canyon Project in place. Moreover, even where the ONP Plans refer to ecosystem restoration, they do so by qualifying their requirements and recognizing pragmatic concerns. The Master Plan, for example, "encourages," but does not require, that ecological processes be allowed to evolve without human interference. NPS, ONP Master Plan, at 48. The ONP Resource Management Plan (RMP) recognizes that certain resource impacts caused by

[2]For example, the Report notes that predators cannot readily be introduced into parks near ranching communities. The obvious reason for this is the need to protect the private property and economic interests of surrounding landowners. Thus, this policy recognizes that established human uses of park resources cannot always be displaced. Id. By analogy, the established use of the Elwha River for private hydropower purpose, long recognized as a legitimate use of ONP resources, represents a situation in which there must be an exception to the ecosystem restoration goal.

JR-11: The staff found that the Olympic National Park plans focus on the restoration and maintenance of primary natural resources in the park. In addition, restoration of the Elwha River ecosystem is specifically mentioned as a primary goal of Olympic National Park. As indicated in Section 4.1.5.2, the applicant's proposal would provide some elements of consistency with the park's plans. Because the plans specifically stated the need for restoration, the staff must consider the amount of restoration each alternative would potentially accomplish.

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human activities (including the effect of dams on anadromous fisheries) "may only be partially mitigated, not prevented or resolved." RMP, at 3:5. The LPP makes no reference to ecosystem restoration, and relies only on the ONP statutory purposes to define management priorities. It also recognized the right of the Glines Canyon Project to exist and does not identify it as a land acquisition need.

A second deficiency in the DEIS' treatment of this ONP restoration issue is its failure to take into account the management zone concept that serves as the foundation for NPS planning. As discussed in the LPP, there are four land management zones for this Park: Natural (over 96% of the ONP); Historic; Development; and Special Use. The Special Use Zone is broken down into two components: the Reservoir Subzone and the Private Development Subzone. The Glines Canyon Project is located in the Reservoir Subzone. These designations are important because the Advisory Board's recommendation to restore primitive conditions has been limited to areas that reflect the conditions of a natural zone.

JR-11 cont'd

The 1988 Policies handbook recognizes that the natural zone is to be managed so that facilities "have no adverse effect on scenic quality and natural processes . . . ." 1988 Policies at 2:7. The Special Use Zone, on the other hand, is managed to provide for non-conforming activities that otherwise might not be consistent with NPS management goals. Id. at 2:8. Because the Glines Canyon Project is located in an ONP Special Use Zone, by definition, the policy objective of the Advisory Board Report to restore primitive conditions does not apply.

The inapplicability of the goal of restoring primitive conditions in Special Use Zones is discussed with express reference to fisheries in the NPS 1988 Policies:

> Reservoirs, and in some cases channelized or otherwise manipulated rivers and streams, in special use zones represent altered environments that may reduce populations of some native species of fish and encourage others.

Id. at 4:8. Rather than require NPS to take steps to restore such areas to pristine conditions, the 1988 Policies authorize manipulation of "reservoirs and other altered waters" for purposes such as recreational fisheries. Active fisheries management is encouraged in such areas. In Special Use Zones it is even permissible to introduce exotic, non-native species. Id. These principles, not ecosystem restoration, apply to the ONP Reservoir Subzone and the Glines Canyon Project.

The third defect in the DEIS' treatment of NPS's ecosystem restoration policy is that it fails to recognize that the Advisory Board Report is limited to actions undertaken by NPS to address wildlife and wildlife habitat concerns inside national parks. The Report does not require other agencies to alter their practices to achieve this goal. Nor does it establish precedent to regulate activities on private lands for this purpose. Clearly, there is no basis in the Advisory Board Report, or any NPS management policies derived therefrom, to establish a requirement that FERC must base licensing decisions for a project located outside a national park, or a project located on private lands inside the boundaries of a national park, on the ambitious, if not unattainable, goal of returning the affected river to "primitive" conditions. If the "natural

conditions restoration" policy as articulated in this DEIS is adapted as the grounds upon which FPA licensing decisions that could impact a national park are to be made, FERC will be confronted with an irreconcilable conflict for scores of hydroelectric projects located outside the boundaries of such areas.

Finally, the DEIS fails to recognize that NPS itself has acknowledged that the ecosystem restoration goal can be met, with varying degrees of success, with the dams in place or the dams removed. For example, in its February 13, 1986 letter to FERC on these Projects, the Department of the Interior ("DOI") indicates that there was at least "one solution" that would "partially restore the anadromous fishery in the Elwha River and retain most of the generating capacity of the existing projects." Total restoration was not required.

In his June 26, 1989 scoping testimony, ONP Superintendent Chandler expressed the possibility that NPS's goals could be met through less than complete ecosystem restoration. He stated, "[e]xtensive studies completed by the Joint Fish and Wildlife Agencies since 1983 have been encouraging, and lead us to conclude that this [restoration of the anadromous fish runs] can be accomplished, with varying degrees of success, with modifications to the existing dams or with dam removal."

JR-11 cont'd

Secretary Lujan reiterates this view in an October 25, 1989 letter to Congressman Dingell which, through an attached NPS memorandum, expressed the view that restoration of the Elwha River anadromous fisheries and the related aquatic and terrestrial communities "can be achieved, through varying degrees of success, either with modifications to the existing dams and their operations, or by removal of the existing dams."

Even in the June 12, 1991, comment letter to FERC submitted on behalf of NPS, FWS, and BIA, where project termination is requested, the Department of the Interior stops short of recommending dam removal. Instead, it states that the "current physical and operational status of the projects" must be changed.

Based on the foregoing discussion, the "second primary resource objective" under consideration for in the DEIS must be revised to indicate that the NPS ecosystem restoration goal: 1) is a continuum that allows for varying degrees of success and does not demand full restoration of pristine, primitive conditions under all circumstances; 2) does not bind FERC or constrain FERC licensing decisions; 3) does not require total restoration of natural conditions within the Elwha River drainage because NPS has expressly exempted the Glines Canyon Project from this goal by virtue of its inclusion in the ONP Special Use Zone and the recognition that the Project has a right to exist and is consistent with ONP management objectives in the ONP Master Plan, LPP, and on NPS correspondence.

Once these changes are made to the formulation of this resource objective, it no longer is the case that the applicant's proposal only "partially meets the goal of restoring natural conditions in ONP." DEIS, at 4-55. This conclusion is based on the DEIS's flawed assumption that natural conditions are either restored in their entirety or not. A more accurate statement

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JR-11 cont'd

would be that the applicant's proposal is "consistent with the ONP Master Plan and LPP, which recognize the right of the Glines Canyon Project to exist, and advances NPS's goal of restoring natural conditions throughout the ONP, although to a lesser degree than could occur with dam removal, if all of the assumptions made about the ability dam removal to be successfully accomplished prove to be correct." This important restatement of the second primary resource objective puts the licensing decision in a more balanced and accurate perspective, and reinforces even more strongly the case for licensing these Projects.

E. NEED FOR POWER

The DEIS properly recognizes that one very substantial cost of the dam removal alternative results from the loss of the power generated at the two projects. The DEIS quantifies this cost from two perspectives: (i) the increased cost to the Daishowa America mill in Port Angeles if it must purchase power from the Bonneville Power Administration to replace the power from the projects, and (ii) the cost the Pacific Northwest region would incur to replace project generation. James River agrees that both perspectives are important in a full assessment of the impacts of dam removal, but offers the following comments on the DEIS methods and results.

1. Cost of Replacement Power to Pacific Northwest Region

JR-12

The regional power assessment in the DEIS is generally consistent with the methods normally utilized by FERC to determine the need for power from a hydropower project in the northwest, recognizing the interconnected nature of the power system in the region, and acknowledging that loss of project power would ultimately accelerate the need for new resources to be constructed in the region. FERC staff properly recognizes that "the existence or nonexistence of Elwha or glines Canyon would neither preclude nor necessitate evelopment of any particular resource" in the region. Potential conservation opportunites at the Port Angeles Mill (if any) thus do not affect the regional need for power from these projects.

The DEIS utilizes accepted methods of analysis, based on the Northwest Power Council's projections of regional need and cost of resources over the next fifty years. The DEIS properly recognizes that the direct replacement cost would be approximated by the cost of equivalent power at the region's long-term marginal cost. The conclusion in the DEIS is that the present value cost to the region of replacing the lost generation from the projects is over $164 million. By contrast, the present value cost of dam retention, including fish mitigation facilities as well as the costs of power generation, is determined to be $39 million.

The Elwha and Glines Canyon hydroelectric projects historically have produced an average of 172,207 MWH, or 19.7 average MW, of electricity per year. Their peak generating capability is 28.5 MW. If the Elwha projects were mitigated for fish and wildlife impacts as proposed by James River, the average annual generation would drop to 168,088 MWH, or 19.2 average MW. The peak generating capability would be unchanged.

Because the current user of the Elwha projects' output, the Port Angeles paper mill, would purchase replacement power from Port Angeles City Light, and BPA is the wholesale supplier to Port Angeles City Light, BPA would be the regional utility with the immediate responsibility to acquire replacement resources. Although a portion of the additional replacement power costs would be borne by the Daishowa America Mill through its purchases of BPA power (see discussion below), the other purchasers of BPA power throughout the region would bear the rest of the $164 million (NPV) of additional power cost due to dam removal.

JR-12: Concurrence is noted.

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COMMENTS OF JAMES RIVER II, INC.

2. Cost of Replacement Power to Daishowa's Port Angeles Mill

The DEIS compares the cost of power from the dams (with fish mitigation facilities) with the cost of power purchased from Port Angeles City Light, and concludes that the cost would be comparable over a period of ten years. DEIS p. 2-35. There are a number of problems with this analysis that render the conclusion seriously deficient and misleading.

JR-13 Daishowa America's comments on the DEIS contain a thorough analysis of this issue, supported by a report prepared by Deloitte & Touche. Their conclusion is that if the dams were removed the net present value of the increase in power cost to the mill over fifty years, as compared to dam retention with fish mitigation facilities, would be $57.7 million.

James River has reviewed Daishowa America's comments and supporting report and concurs with them. These analyses demonstrate that the DEIS is seriously in error in suggesting that the cost of power to the mill would be similar whether the dams are retained (with fisheries mitigation) or removed. The analysis of this very important issue must be revised, and the conclusion must reflect the very substantial cost impact of dam removal on the mill.

RESPONSES TO JAMES RIVER II, INC.

JR-13: EIS Section 2.7.3 has been modified to include a 30-year period of analysis based on BPA wholesale rate projections.

F. DECOMMISSIONING AND SEDIMENT

1. Decommissioning and Sediment Stabilization Plan

JR-14 The DEIS presents a plan for decommissioning and removing the Elwha and Glines Canyon Dams that appears at first glance to be capable of restoring the river ecosystem with only short term environmental impacts and at a cost of 64.3 million dollars. However, upon closer inspection, it is clear that the decommissioning scheme presented in the document grossly underestimates the engineering risks, costs, and risks of environmental damage associated with removing the dams and overstates the potential benefits of dam removal. The conceptual nature of the decommissioning and sediment stabilization scheme identified in the DEIS, and subsequent discussions with FERC staff regarding details of the plan, makes it clear that the plan has not been developed sufficiently to determine if it will actually work. In fact, as discussed in the following sections, the plan has several serious shortcomings and will not perform as stated in the DEIS. As a result, removal of the dams will result in substantially higher costs, both monetarily and environmentally, than those presented in the DEIS.

2. Reservoir Levels During Dam Removal

JR-15 The Dam Removal Plan presented in the DEIS (Appendix A, Part 3) provides for gradual drawdown of Lake Aldwell and Lake Mills over several construction seasons. As lake levels are drawn down, sediment dredging and stabilization activities would take place. The river would be channelized through the delta deposits to minimize erosion of the deltas, and eroded sediments would be dredged and placed in storage terraces within the reservoirs. The terraces and sideslopes would be matted and seeded to provide erosion control. During each construction season (April through October), the lakes would be drawn down to a lower level, and dredging and stabilization of sediments would progress down to that level. While conceptually this scheme would seem to be an effective way to manage sediments accumulated in the reservoirs, it fails to recognize the fact that based on actual flows in the river, the reservoir levels will not respond as suggested in the DEIS, but will rise well above the levels stated in the plan several times per year. This will not only preclude sediment management and stabilization activities during a good portion of each of the construction seasons, but will also result in inundation and destabilization of the previous season's work, will kill any vegetation that had begun to grow on the terraces and will require a reiteration of stabilization activities.

Although the DEIS recognizes that inundation of the reservoirs would occur during the dam removal process (staff memorandum provided as Addendum 1 of FERC's response to a request for additional information, provided in a letter dated May 10, 1991), it is barely mentioned in the DEIS and the analysis of dam removal ignores the consequences of reservoir inundation during the process ("Major flood events would result in increases in the reservoir level and, under the most severe conditions, use of the existing project structures to discharge

JR-14: Several options are available for dam removal, a conservative approach from a cost standpoint has been included in the FEIS (see Section 2.3 and Appendix A). More assessment would need to be performed at the exploration stage, prior to design, before a final removal option could be selected. As outlined in response JR-5, the dams at each project would be lowered in consonance with the reservoir drafting through diversion tunnels, thereby eliminating the possibility of the reservoirs inundating sediment stabilization activities. Inclusion of the dam lowering as part of the diversion plan would reduce the risk of cost growth in the sediment stabilization program. In the unlikely event that the diversion tunnel plan scheme were found to be unfeasible, other options mentioned in Appendix A could be employed.

JR-15: Comment noted. There are measures that can be taken to obviate the ability of the reservoir to rebound during low frequency flow events. The most obvious is to provide greater flow capacity through the diversion tunnels by increasing the area of the tunnels or perhaps even the number of diversion tunnels at each site. In lieu of this more costly approach, staff has elected to lower a portion of each dam as the reservoirs are drafted and thereby prevent the refilling of the reservoirs much above the elevation of the dam notch weir elevations. In order to further reduce the exposure to inundation, the construction schedule has been shortened so that drawdown at the Glines Canyon Project would be accomplished over two seasons and drawdown at Elwha would be accomplished in one season. In consonance with the diversion tunnel and the incremental lowering of the dam, the power tunnel would not be needed to pass higher velocity flows, and peak discharge could be correspondingly restricted. Refer also to responses JR-5 and JR-14.

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inflows." Page A-51). FERC staff's analysis of reservoir levels during dam removal is included in a memo that analyzed reservoir levels in response to a 1-year, 2-year, and 5-year flood event assuming reservoirs were empty at the start of the flood event. The memo notes, "it is reasonable to expect some significant fluctuations following reservoir drawdown. ...[O]ver the removal period Glines can reasonably be expected to experience fluctuations as much as 100 feet, and the Elwha Reservoir achieving an essentially full pool over the period. These significant fluctuations could occur any time during the October-April period." The FERC analysis (Addendum 1 of FERC's May 10, 1991 letter) was based on statistical flood frequencies which gives an indication of the likelihood of reservoir inundation during a flood event, but does not show how the reservoir levels would respond to actual river flows over the 5-year construction period.

JR-15 cont'd

The Applicant has performed an analysis of reservoir elevations for the Glines Canyon Project using the scheme set forth in the DEIS and actual river flow records (see Appendix 1 for details). The DEIS states that Lake Mills will be drawn down from full pool (El. 610) to El. 510 during the second construction season, from 510 to 460 during season 3, and from 460 to 430 during season 4 at which level it will remain through season 5 when the dam is removed. Drawdown would progress at a rate of 1 foot per day. The Applicant's analysis assumes that the new diversion tunnel described in the DEIS is capable of discharging 3,500 cfs, the existing power conduit can discharge 2,850 cfs when reservoir elevations exceed 533 feet, and the existing spillway on the dam can discharge flows at elevations above 590 feet. It should be noted that the DEIS states that flows of 6,000 cfs are possible through the existing power conduit if the turbine runner is removed. However, a 6,000 cfs flow would produce velocities in excess of 75 feet/second in the conduit and would destroy the existing conduit. When reasonable velocities in the conduit (30 feet/second) are assumed, the flow noted above (2,850 cfs) can be discharged through the conduit.

River flows representative of 85% exceedence conditions by volume over a 4-year period (i.e. one would expect flows to be higher than these conditions 85% of the time), 50% exceedence, and 15% exceedence conditions were analyzed.

Figure 2 (from Appendix 1 of this document) shows the results of the analysis using a block of data with a 50% exceedence probability (in other words, flows during an actual decommissioning scheme would have a 50% chance of being less than these, and a 50% chance of being higher). The dashed line in figure 2 shows the reservoir levels as stated in the DEIS, and the solid line shows actual reservoir levels that would occur during decommissioning if it took place during the years noted. As shown on the diagram, during the Year 2 construction season, things go as planned. The reservoir levels increase only slightly during storms over the winter. However, during the Year 3 construction season problems begin. High flows do not allow the reservoir level to get down to the desired 460 feet until late September, leaving only a few weeks for sediment handling activities. The following year is even worse, with reservoir elevations well above the Year 2 elevation of 510 throughout most of the construction season. It is December before the lake gets down to the desired 430 foot elevation, but it immediately

JR-15 cont'd

jumps back up to elevation 570 during a flood event. Any construction activity that could take place during Year 4 would likely be attempts trying to restore conditions to the Year 2 level of stabilization. During Year 5, elevation 430 is finally reached in early October, leaving one month to do the stabilization work planned for Year 3 and 4 and to remove the dam before high flows hit again in November. It is obvious from this analysis, that if dam removal were begun during this time period it would not be accomplished in the 5-year time frame specified in the FERC document. Each time the reservoir levels rise for any significant period of time, much of the vegetation planted below that elevation would die and need to be replanted. Sediment moving in from upstream would also be deposited in the previously dredged river channel at the higher reservoir elevation. As a result, the sediment management costs would be significantly higher than those noted in the DEIS (nearly 25 million dollars; Table A-21) because sediment handling, mulching, and revegetation measures would have to be redone several times before the dam was actually removed.

Appendix 1 of this document shows the effects of both lower and higher flow scenarios on reservoir levels. Even the low flow, 85% exceedence scenario shows that the reservoir work areas would be inundated several times per year, and the dams could not be removed within the 5-year time frame specified in the DEIS.

A similar analysis could be performed for the Elwha Project and would likely show that lake levels rise higher and more frequently due to the much smaller storage capacity of Lake Aldwell.

3. Stability of Sediment Storage Terraces

JR-16

The DEIS states that side slopes on the sand and gravel terraces will be graded to 4.5:1 and 10:1 on storage terraces. FERC staff indicated at the public meetings that their analysis shows these slopes would be stable under dry conditions, but would not be stable if the terraces are saturated. As noted in the previous section, the reservoir will be inundated during high flow conditions, expected to occur one to several times per year during the dam removal process. Since no provisions have been made for drainage of the terraces, it is obvious there will be many slope failures not accounted for in the DEIS. This will result in either more extensive and expensive erosion control measures, or greater environmental impacts associated with higher levels of sediment moving through the river system and it can be expected to extend the construction period well beyond the assumed five years.

4. Lake Mills Diversion Canal

JR-17

The DEIS proposes that a canal be constructed along the left (west) bank of Lake Mills during Construction Season 2. It is intended that the canal divert 1,000 cfs of clear water from the upstream end of Lake Mills around the reservoir to reduce turbidity downstream of Lake

JR-16: Under the modified diversion scheme outlined under response JR-5 above, both the drawdown period would be significantly shortened and reservoir fluctuation would be effectively eliminated through the concurrent lowering of the dam.

JR-17: Under the modified diversion scheme outlined in JR-5 above, the diversion canal has been eliminated, along with its attendant diversion structure, and thus the majority of the concerns raised in this comment are moot. Moderately silt free water can still be added to the downstream channel from the notched dam, however the desirability of accomplishing this is significantly diminished as staff has concluded that the removal of all sediment contributing activities should be accomplished in the shortest possible time frame consistent with reservoir sediment stabilization activities. Thus the need for the diversion canal has been eliminated.

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JR-17 cont'd

Mills during construction. It is not clear from the superficial description of the canal in the DEIS whether or not the canal will function as planned there are a number of indications that it will not.

According to FERC staff, the diversion structure in the river at the upper end of the reservoir would be a 20-30 foot-high earthfill dam armored with rip rap. It is likely that a gate or some type of structure would be required to control the amount of water that enters the canal, but there is no indication of this in the DEIS text or budget. The earthfill dam will be designed to fail during flood conditions, but there is also no provision in the budget for rebuilding the diversion structure each year. As sediment is transported from upstream, the area behind the earthen dam will fill with sediment. There are no provisions for keeping this sediment from entering and filling the canal, or for clearing it each year.

FERC staff have indicated that the diversion canal itself will have a trapezoidal cross-section with a 10-foot base width and be 10 feet deep. The axial slope of the canal will be 0.001 and velocities will be below 6 fps. The canal will be unlined and excavated into native materials along the side of Lake Mills.

Based on maximum permissible velocities for canals in native materials, velocities must be below 4 fps for clear water in coarse gravel channels, and considerably lower (1-2 fps) for finer-grained sediments such as those that could be expected along the canal route. The DEIS's canal design requires either lining or excavation into bedrock in order to be stable. Both these measures would substantially increase the cost of the canal.

The FERC design and budget do not include provisions for the canal crossing the tributaries that exist along the side of Lake Mills (particularly Boulder Creek) or for traversing the steep, bedrock slopes found along the proposed canal route. The DEIS indicates that the canal water will be discharged through the existing power conduit with the turbine removed. This will require an energy dissipation structure at the penstock outlet to prevent high velocity water from eroding the river channel at the outlet, causing environmental harm and public safety concerns. All of these measures will add considerable expense to the dam removal scheme proposed by FERC.

JR-18

5. Details Required in FERC's Sediment Stabilization Plan

Much of the ability of the DEIS's dam removal plan to limit sediment impacts rests upon the success of the reservoir stabilization plan. As noted in the previous sections, the plan was not developed in sufficient detail for FERC staff to determine whether or not it was feasible. In order to truly evaluate the alternatives presented in the DEIS, a much more detailed sediment stabilization plan (i.e. an Erosion and Sediment Control Plan - ESCP) along with a risk assessment analyzing the likelihood of the plan working as intended is needed. Once a detailed plan is developed, more realistic monetary and environmental costs associated with the dam removal procedure can be determined.

JR-18: See response ITT-20.

In developing the ESCP and risk assessment, FERC should follow their own guidelines in that the level of detail of an ESCP should be appropriate for the degree of instability at the project site and the risk to downstream resources. For purposes of evaluating sediment risk to the downstream environment, FERC defines a high risk project as:

> Project area has high instability in combination with any level of watershed instability and with any amount and type of anadromous fish habitat "at risk." (FERC workshop, May 16, 1989 in Olympia, Washington)

Certainly the proposed dam removal alternative would be classified as an extremely high risk project. Not only does the project area have high instability, but the anadromous fish resource downstream would be very vulnerable to any sediment impacts because the fish have no alternative habitat (i.e. tributaries) to utilize. In addition, sediment eroded during the dam removal scenario has a high risk of effecting hatcheries/rearing ponds, water supplies, homes, and flood control structures downstream.

JR-18 cont'd

As a result of the high risk of environmental impact associated with FERC's dam removal alternatives, a detailed ESCP should be prepared prior to any determination of which licensing alternative to choose. FERC has clear guidelines for ESCP preparation. Recent FERC requirements for small hydroelectric projects in the Skagit and Nooksack basin include:

> Sedimentation from erosion and slope stability impacts from construction at the project could have adverse impacts on aquatic resources in...the river. Therefore, provide a detailed site-specific erosion, sediment, and slope stability control plan for the project based on actual site conditions that includes...measures for permanent stabilization of the site;...potential for mass soil movement;...a description of a monitoring and maintenance program that also outlines procedures for emergency situations. ....Due to the high potential for erosion and mass movement on the oversteepened project area slopes, potentially severe and possibly unmanageable erosion, sedimentation, and mass movement impacts of major proportions could be expected at the project. Therefore provide a stability survey of the project impact area and adjacent slopes....provide detailed descriptions with appropriate drawings of the mitigative measures that would be implemented to minimize erosion, sediment losses, and mass movement during project construction and through the life of the project.

If FERC requires these measures prior to making a licensing decision on small-scale hydroelectric projects that have a much smaller construction area and much less risk of instability, certainly even more stringent requirements should be applied to FERC's dam removal scenario prior to a licensing decision.

6. Risks Associated With Dam Removal

JR-19

The DEIS discusses the environmental effects associated with dam removal assuming that all erosion control measures function as planned. FERC indicated (letter of May 10, 1991) that they did not perform a risk assessment on the dam removal plan, but assumed "reasonable performance." As discussed in the preceding sections of this document, there are many risks

JR-19: The sediment stability within the reservoir would not be subject to the risk of frequent inundations as a result of the modified diversion scheme described in the FEIS, Section 2.3 and Appendix A. This will greatly facilitate the ability of the sediment stabilization program to fulfill the objectives specified in the DEIS.

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associated with FERC's plan for controlling erosion under even normal conditions. Heavy rainfall and flooding are common events in the Pacific Northwest. The storms of the past two winters caused slope failures, stream bank erosion, and flood damage throughout the Olympics and Cascades. What would the effects of these storms have been on the stability of the newly vegetated terraces in the reservoir areas? Would the "natural armor material" proposed to keep the river channel from undercutting these terraces have worked? If not, how much sediment would have been released into the river system and what would the effects have been downstream? These are the types of questions that need to be answered before a realistic comparison between the different licensing options for the projects can be made. FERC requires this type of risk assessment be performed on other hydroelectric projects prior to a licensing decision. It is even more important here.

JR-19 cont'd

Experience in the Removal of the Sweasey Dam, Mad River, California is cautionary with regard to Dam Removal (NRC, 1991) (Appendix 2 of these comments). In 1969 California Fish and Game, COE, and the Dam owner City of Eureka evaluated the dam and decided to remove it and associated structures. Although there was no formal plan, it was expected that (1) there would be an acceptable sediment load for several years, (2) the river would form a channel through the fine sediments and debris behind the dam, carrying most sediment downstream during high flow events while the remaining sediment banks would stabilize and revegetate, and (3) the stream channel downstream of the dam would have minor changes.

In the first winter following removal of the dam, all of the trapped sediment and debris was removed by floods and deposited downstream. By the next summer it was evident that the channel 3 to 5 miles downstream had been altered. Riffle and pool habitat had become braided stream channel. Although the alteration of the stream was expected to be only transitory, many of the changes still persist twenty years later and alteration of the channel has occurred all the way to the mouth of the river.

This experience underscores the importance of a careful evaluation of the risk that the sediment behind the Elwha dams will not behave exactly as predicted, and identification of potential impacts.

The merit of FERC's decommissioning scheme rests upon its ability to keep sediment loading within acceptable bounds. The Applicant requested additional information about the FERC decommissioning scheme in a letter dated April 9, 1991. In particular, the Applicant requested a risk assessment that determines the probability of a revegetation and stabilization measures functioning properly. This information would have permitted an assessment of FERC's "best case" scenario described in the DEIS. In its letter of May 10, 1991, FERC commented "not available; reasonable performance was assumed." In view of the questionable performance of the dewatering plan and the Lake Mills diversion plan discussed above, the Applicant believes that FERC must provide a risk analysis of their decommissioning scheme before the public will be in a position to assess its merits and provide informed comment.

7. Summary

JR-20 From the above comments, it is clear that the FERC plan for removal of the Elwha and Glines Canyon Dams will not work as described in the DEIS, and a workable plan would cost much more that the 64.3 million dollars stated. The risk of failure of the sediment stabilization plan is high, and resulting environmental damage would be great, yet the FERC plan does not even acknowledge that failure could occur, let alone the consequences of such failure. In order to give the public an opportunity to meaningfully compare and comment on all alternatives for licensing of the Elwha and Glines Canyon Projects, FERC must provide a more detailed and realistic analysis of dam removal.

JR-20: Comment noted.

There is a risk associated with any major construction undertaking that cannot be fully addressed without significant and costly field explorations. However, the integrity of the site substrata and the design of the major impoundment structures leads staff to conclude that there is an acceptable probability that the two dams and their attendant structures can be successfully removed in accordance with the method, budget, and schedule described in the FEIS in Section 2.3 and Appendix A. Furthermore, there is a high probability that explorations precedent to actual removal design would reveal even more cost effective means for removing the projects. There is a lesser possibility that explorations would render the dam removal scheme unacceptable.

Concerns raised about the ability to stabilize reservoir sediments are of more immediate concern in that the stochastic nature of the hydrometerological events that impact the Elwha River are much more difficult to predict. Nevertheless, the modified river diversion and sediment stabilization schemes contained in the FEIS would greatly facilitate sediment stabilization under the dam removal alternative.

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8. Decommissioning and Sediment Comments

COMMENT CD-1 Elwha, Dam Removal Schedule

Reference: Sec 2.3.1, page 2-17, 1st para, "Removal of the dam..."

JR-21 The DEIS states "Removal of dam following sediment stabilization." and Figure 2-4 indicates that dam removal occurs in year 5. Does the statement in Sec 2.3.1 mean that dam removal does not occur until sediments are reasonably stabilized. If this is the case the DEIS should clarify that dam removal may not take place in year five, describe the probability of dam removal occurring in any given year, and revise other analyses throughout the DEIS to reflect the median estimate for dam removal and the possibility of a longer construction period.

COMMENT CD-2 Elwha, Stability of Spoil Terraces

Reference: Sec 2.3.1, page 2-18, para 2-4, "The spoils resulting..."

JR-22 The DEIS describes a plan in which sediments would be stored in spoil terraces within the reservoir basin. Much of the delta and lake sediments are in sloping foreset beds. These beds provide inclined cleavage planes. Since the river or channelization efforts would cut the toe of slopes, the FERC must describe how long term stability of these deposits and of the overlying storage terraces will be achieved.

COMMENT CD-3 Glines, Diversion Canal

Reference: Sec 2.3.2, page 2-19, 4th para, "To provide the capability..."

JR-23 The DEIS describes a diversion canal along the west shore of Lake Mills. The DEIS does not describe in sufficient detail the diversion dam, control structures, construction and maintenance of the canal to permit evaluation of practicality or cost. The FERC must provide plans, schedules, and construction and operating costs for the diversion canal and explain how Boulder Creek is crossed. (See CD-28.)

COMMENT CD-4 Glines, Dam Removal Costs

Reference: Sec 2.3.4, page 2-22, 1 & 2nd para, "The initial cost..."

JR-24 The DEIS provides some, but not all costs for dam removal. The Revised DEIS should include the cost of raising COE's dike at Elwha Reservation, improving or replacing City of Port Angeles Municipal and Industrial Water supplies, protecting bridge and highway abutments, and

JR-21: Section 2.3.1 has been revised to indicate that removal of the dam is no longer contingent upon sediment stabilization. Instead, the dam would be removed concurrent with the drafting of the reservoir.

JR-22: The term "cleavage planes" refers to rock. The reservoir delta sediments consist of unconsolidated granular material. Its stability is controlled by the degree of interparticle friction and cohesion that is strongly influenced by the degree of saturation and slope. See response SOW-49.

JR-23: The Glines Canyon diversion scheme has been refined (Section 2.3.2 and Appendix A), thereby eliminating the diversion canal.

JR-24: The cost estimate contained in the FEIS, Appendix A and Section 2.3.5, more clearly portrays all capital and operating costs of dam removal.

JR-24 cont'd off-river facilities for fish production during the decommissioning phase. Fish facilities would include: fish traps, off site holding, incubation, water supply, and rearing facilities. (See M-2 and M-4 in Section M, Costs.)

COMMENT CD-5 Glines, Construction Impacts on WQ

Reference: Sec 4.2.1.1, page 4-77, 3rd para, "Clay and most..."

JR-25 During much of the construction season flows are less than 1000 cfs. What are the water quality conditions at flows between 200 cfs and 500 cfs, common late summer flows? Would these flows and their sediment load impact the Ranney Well systems, the WDF Chinook Rearing Facility, the Elwha Tribal Hatchery, and M&I water supplies? What effect would these low flows and high sediments have upon anadromous fish transport and holding? Would water released from the Glines Reservoir violate state Water Quality Standards?

COMMENT CD-6 Glines, Construction Erosion

Reference: Sec 4.2.1.1, page 4-79, 2nd para, "Erosion from..."

JR-26 The DEIS discusses water quality and sediment transport following dam removal. The Revised DEIS should discuss more extensively water quality and sediment in the middle and lower river during and following dam removal for high (10,000), average (1200 cfs), and low (500 cfs) flow conditions. This discussion should address water quality under these conditions with respect to meeting state Water Quality Standards.

COMMENT CD-7 Glines, Erosion Control Measures

Reference: Sec 4.2.1.1, pages 4-77 through 4-80.

JR-27 Both FERC's analysis (Addendum 1 of FERC's Letter of May 10, 1991) and the Applicant's analysis (Appendix 1) indicate that the reservoir will refill repeatedly and sometimes for long periods (months). The control and stabilization measures discussed in the DEIS will not work as described. The FERC must provide a practical decommissioning scheme, an Erosion, Sediment Control Plan and analysis of the impacts of each before meaningful comments on a decommissioning scheme can be made.

JR-25: Water quality conditions under the dam removal alternatives would be least adverse during low-flow conditions. Because suspended sediment concentrations are directly related to river discharge, total suspended sediment and turbidity values would be relatively low during late summer flows. Under staff-recommended mitigation measures described in Section 4.2.2.3, water quality impacts to water users would be minimal. These measures and measures proposed in a study conducted by CH2M HILL are addressed in responses DAC-5 and DAC-6. Violation of state water quality standards are addressed more thoroughly in Sections 4.2.2.1 and 4.2.2.2 under the recommendation of the State Department of Ecology.

JR-26: Comment noted. Both sediment transport and water quality impacts of the dam removal alternatives have been described in greater detail in Section 4.2.1.1 and Appendix C. Predicted violations of state water quality standards are also described in greater detail.

JR-27: As described in responses JR-5 and JR-14, reservoir refilling has been eliminated by coincident lowering of the dam with reservoir drawdown.

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COMMENT CD-8 Glines, Reservoir Refilling

Reference: Sec 4.2.1.1, page 4-79, 5th para, "During the winter season..."

JR-28 The analysis of winter conditions in the DEIS does not address the disruptive impact of winter storms filling the partially dewatered reservoir. Such events will partially or entirely refill the reservoir, saturate soils, remove mulch, and kill establishing plant cover. The saturated soils will be unstable and would be extremely difficult to work upon until properly drained. The soils would be especially susceptible to erosion. The Revised DEIS should address decommissioning and restoration in the light of reservoir refilling or provide a decommissioning plan that would achieve dewatering goals.

COMMENT CD-9 Elwha, Maintain Other Civil Works

Reference: Sec 4.2.1.1, page 4-82, 2nd para, "Elwha dam removal..."

JR-29 The DEIS does not address the requirement to maintain bridges, road abutments, diversion groins, and other civil works downstream of the Glines Canyon Project during and following dam removal. The Revised DEIS must identify measures necessary to protect downstream civil works and their costs. (See Tables M-3 and M-4 in Section M, Costs.)

COMMENT CD-10 Elwha, Labor Costs

Reference: Appendix A, page A-43.

JR-30 The DEIS Appendix A in Table A-1, page A-44, indicates personnel requirements and payroll. Amounts are indicated to be inflated to 1995 dollars. The amounts shown are not consistent with known payroll costs in the area. The FERC staff was unable to comment on the source or basis for the labor cost rates used in the estimates. The Revised DEIS should state the basis of the labor and associated equipment costs used in the cost estimates. In addition, it appears that total personnel required is not consistent with the amount of effort required. The Revised DEIS must present cost and personnel requirements that are consistent with effort required.

COMMENT CD-11 Elwha, Construction Diversion

Reference: Appendix A, page A-43 through A-46.

JR-31 The DEIS states that the lake tap process is "complex." It is a high risk operation at best, when geologic conditions are known. The DEIS also states that geologic information is not available. The DEIS is not consistent in that a lower percentage of contractor overhead and

JR-28: As described in responses JR-5 and JR-14, reservoir refilling has been eliminated by coincident lowering of the dam with reservoir drawdown thus eliminating the disruptive effects that might otherwise occur from reservoir refilling.

JR-29: Additional costs have been included to protect the downstream flood control levee (see Sections 4.2.1.2, 4.2.1.3, and Appendix A). Because the existing dams provide little protection against low frequency flow events, no extraordinary measures have been taken for these same events under the dam removal alternative.

JR-30: The general basis for the labor and equipment costs used in the Elwha and Glines Project construction cost estimates is as follows:

1) A single labor rate of $30/hr (1990 level $) was used for all labor classifications. This average labor rate includes base pay, fringe benefits, workers compensation insurance, federal and state unemployment costs, social security taxes (FICA), builder's risk insurance, and public liability costs. All these elements make up the contractor's cost for labor.

2) Equipment rates (1990 level $) that were used represent rental (or ownership) and operating costs for construction equipment. Specific equipment rates were selected according to type of equipment, duration of equipment usage, productivity required of equipment, fuel consumption rates, assumed age of equipment, and site-specific operating conditions. As a general guide to the appropriate cost of equipment rental (ownership) and operating costs, the Contractor's Equipment Cost Guide, published by Dataquest and Means Heavy Construction Cost Data, 1990 were used.

JR-31: While the lake tap would be complex, it is certainly an operation that is well within the capability of most well managed heavy civil construction companies. Under the refined diversion scheme contained in the FEIS, much of the uncertainty associated with sediment stabilization has been eliminated.

JR-31 cont'd profit is used in the cost estimates for lake tap work than in the sediment stabilization work. FERC staff was unable to provide comments on this apparent inconsistency. The Revised DEIS must relate contractor overhead, profit, and contingency to risk inherent in the various tasks.

COMMENT CD-12 Elwha, Risk Analysis

Reference: Appendix A, page A-43 through A-46.

JR-32 The DEIS did not perform a risk analysis to define possible increased costs if the lake tap method will not be possible due to geology or topography restraints. The DEIS states such a possibility exists, but provides no alternate plan or cost. The costs estimate includes no allowance for an alternate plan.

The Revised DEIS must assess the risk of a lake tap not working, identify an alternate scheme and its cost. It is considered by FERC staff that the 25% contingency added to the estimates would cover such risk. If the lake tap method fails, the entire construction cost of the diversion facilities could be lost. $4,000,000 (Ref. page A-95) is allowed for the lake tap with a contingency of $997,000. Contingency costs are insufficient to cover unknown risks. The Revised DEIS must evaluate risks and include appropriate costs to cover contingencies.

COMMENT CD-13 Elwha, Diversion Facilities

Reference: Appendix A, page A-43 through A-46.

JR-33 The DEIS contains no operating plan for the diversion facilities used to drawdown the reservoir. The diversion facilities are sized, to accommodate flows of 3500 cfs. FERC staff indicated that the reservoir would refill (inundate) to full pool during a two year flood event. No analysis was performed using an actual hydrograph to determine the frequency or duration of such reservoir filling. Appendix 1 provides an analysis of reservoir operations based upon FERC staff's proposed diversion facilities and drawdown rates. Based upon Appendix 1, FERC's proposed decommissioning scenario is not feasible because of frequent refilling of the reservoir. FERC must provide a practical, feasible decommissioning scheme supported by appropriate analysis indicating its practicality before meaningful comments can be made.

COMMENT CD-14 Elwha, Sediment Management

Reference: Appendix A, page A-46 through A-49.

JR-34 In the first paragraph of this section the DEIS addresses the negative aspects of increased sediment transport in the river system. It acknowledges that increased channel elevations could result, with increased flood levels downstream. The DEIS does not include an assessment of risk

JR-32: A definitive risk analysis was not performed because the geology of the site and the structural integrity of the structures that would be lowered during the reservoir drawdown are such that there is a reasonable expectation that the Elwha diversion can be accomplished within the estimated capital cost. Staff's assessment of all diversion options reveals that in-depth explorations may well lead to the conclusion that one of the less expensive diversion options as described in Appendix A of the FEIS is superior to the conservative diversion scheme recommended for the dam removal option at this present stage of analysis. Although complex, lake tap technology is by no means undesirable. Numerous lake taps have been performed throughout Europe and the United States with a high degree of success. The Elwha Project has a very short proposed diversion tunnel; thus, the risk capital for this diversion scheme is relatively low, especially when compared to some of the other major features of the dam removal option such as sediment stabilization or potable water supply costs.

JR-33: This comment is no longer valid under the refined diversion scheme. See responses JR-5 and JR-14.

JR-34: See revised text in Sections 3.1 and 3.2 of Appendix A, and Sections 4.2.1.2 and 4.2.1.3 of the main text.

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JR-34 cont'd

to downstream facilities or the cost to maintain these facilities. Structures such as dikes, existing diversions, bridges, roads, and other facilities, including salmon production facilities could be very adversely affected by the altered stream channel. The DEIS also notes that failures of the sediment terraces built in the reservoir are highly likely. Such failures would add further to sediment loading, and yet the risks and associated costs of an erosion and sediment control are not clearly defined. The Revised DEIS must assess adverse affects on existing facilities and necessary corrective or replacement costs and include these costs in the cost summary. An erosion and sediment control plan meeting FERC's usual standards would be a necessary component of this assessment.

COMMENT CD-15 Elwha, Slope Stability

Reference: Appendix A, page A-46 through A-49.

JR-35

The risk of slope failures is acknowledged in the DEIS in its slope stability analysis. The DEIS analyzed sediment slopes that were 4.5 horizontal to 1 vertical. The analysis shows such slopes to be stable when dry but indicates that the slopes would fail if saturated. FERC staff indicated that because the diversion scheme was adequate, the slopes would remain dry, and therefore stable. The duration and/or frequency of reservoir filling each winter was not analyzed sufficiently. The assumption that the sediment terraces would remain dry is invalid (see FERC's Addendum 1, May 10, 1991 and Applicant's Appendix 1). The reservoir will refill repeatedly and slope failure will occur frequently. FERC must provide a practical decommissioning scheme, supported by appropriate analysis, including a reservoir operating analysis and a slope stability analysis before meaningful review and comment.

COMMENT CD-16 Elwha, Reservoir Operations

Reference: Appendix A, page A-46 through A-49

JR-36

The DEIS does not contain a practical reservoir operating plan during decommissioning. Slope stability is influenced not only by the frequency and duration of inundations, but is very sensitive to the rate of drawdown of the reservoir. It was stated that the storage terraces were not designed as structural fills with gradation and compaction requirements. No drainage facilities are included in the storage terraces. If the drawdown rate is limited sufficiently to preclude slope failures then, the reservoir will be inundated repeatedly for extended periods of time each winter. Repeated and/or prolonged inundation is incompatible with the entire sediment stabilization plan as it exists in the DEIS. FERC must provide a practical decommissioning plan and schedule.

JR-35: Reservoir refilling would be eliminated under the modified diversion scheme described under responses JR-5 and JR-14. This modified scheme would eliminate reservoir fluctuations and consequential soil saturation and slope failure.

JR-36: While the drawdown rate would be controlled, the ability of the reservoir to refill has been eliminated under the modified diversion scheme outlined under responses JR-5 and JR-14.

COMMENT CD-17 Elwha, Excavated Channel

Reference: Appendix A, page A-46 through A-49.

JR-37 The DEIS states that the excavated channel would be stabilized with riprap armor and large woody debris. No plan for installation and anchoring this material is provided. The source of armor material is not identified. The cost of this work does not appear to include any provision for rework required due to failures of stabilization measures due to either high flows, slides and/or reservoir inundation. The Revised DEIS must determine the attributes of material required to provide a stable channel, identify the source of armor material, indicate how the material would be anchored, and provide costs.

COMMENT CD-18 Elwha, Capacity of Storage Terraces

Reference: Appendix A, page A-46 through A-49.

JR-38 The DEIS proposes to excavate sediments in the proposed channel and move the material to sediment storage terraces. FERC staff was unable to confirm either that the designed sediment terraces used the 4.5 to 1 slopes or that there was sufficient storage volume in the designed terraces for all the excavated materials. The Revised DEIS must provide an analysis which indicates that excavated sediments balanced with the storage volume of the of designed terrace.

COMMENT CD-19 Elwha, Risks to Diversion Structures

Reference: Appendix A, page A-46 through A-49

JR-39 During high flow events the reservoir will fill (see Appendix 1). During these events the river will transport sediment into the upstream end of Lake Aldwell. The sediment will be deposited as a delta (dependent upon reservoir elevation) that would be superimposed on the excavated channel. The decommissioning scheme does not address this situation. The Revised DEIS must provide a practical decommissioning scheme supported by appropriate analysis including a description of the volume and location of sediments transported into the reservoir and the excavated channel. The scheme must determine the extent of reexcavation required to restore the channel.

JR-37: The text in Appendix A has been expanded; however, the need for rework due to inundation has been eliminated under the modified diversion scheme.

JR-38: Comment noted.

JR-39: As the reservoir is lowered and stabilized by the coincident lowering of the dam, sediment inflow would be deposited in small deltas that correspond to the elevation of the reservoir. These small isolated event deltas would be excavated in the same fashion that the main delta in the present upper end of the reservoir would be excavated. Refer also to response JR-14.

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COMMENTS CD-20 Elwha, Repeated Excavation of Channel

Reference: Appendix A, page A-46 through A-49.

JR-40 The DEIS is unclear as to whether any costs were included in the estimates for removal of slide material from the channel or for the re-excavate the channel when slides or sedimentation is deposited in the channel. Additional information provided by FERC (May 10, 1991, Addendum 1) and the Applicant's Appendix 1 indicate that the reservoirs will be repeatedly reinundated. No risk or cost analysis was performed of the effects of repeated inundation. FERC must provide a practical decommissioning scheme.

COMMENT CD-21 Elwha, Plant Restoration on Terraces

Reference: Appendix A, page A-49 through A-50.

The DEIS does not address the extended or frequent inundation of the reservoir area as mentioned above. Any revegetation work would be subject to repeated inundations and survival of any planted materials is questionable. The cost estimate does not address the requirement for frequent re-work of the restoration operation. The failure of early attempts to establish vegetation will produce severe downstream impacts and is incompatible with the DEIS's objective to establish vegetation quickly during sediment stabilization activities.

JR-41 The contingency cost for sediment management is $2,923,000, compared to a total direct cost of $8,472,000, including revegetation costs (Table A-17, page A-96). This amount would not be sufficient to cover the extent of re-work required due to slides in the reservoir, vegetation failures, or damage to downstream facilities due to large discharges of sediment.

The cost estimate for sediment management includes an owner cost of 30%. Owner costs would include engineering and permitting costs. The cost estimate will not cover the cost of acquiring a variance from state Water Quality Standards, complying with FERC imposed water quality protection measures or practicing an Erosion and Sediment Control Plan. The Revised DEIS must identify necessary protection measures and include their costs in the cost estimate.

COMMENT CD-22 Elwha, Removal of Project Facilities

Reference: Appendix A, page A-50.

JR-42 The DEIS states that the concrete and rubble from the reservoir just upstream of the dam would be removed to a disposal site. The disposal site is undefined. It is known that the rubble upstream of the dam consists not only of rock and soil material but also contains timber debris, cables and other unknown items that were used to construct the timber mattress to reduce

JR-40: Preclusion of re-inundation due to the coincident lowering of the dam would eliminate additional costs that may have been needed for sediment stabilization under the DEIS.

JR-41: As mentioned in JR-5 above, inundation of the reservoir would be eliminated under the modified diversion scheme.

JR-42: Comment noted; see revised text in Appendix A, and Sections 3.1.6 and 4.2.5.1 in the main text.

JR-42 cont'd leakage under the dam. The Revised DEIS must describe the proper excavation and disposal of this material and assess the impacts of the upland disposal.

COMMENTS CD-23 Elwha, Construction Sequence

Reference: Appendix A, page A-50 through A-52.

JR-43 The construction sequence envisioned by the DEIS entails leaving the dam in place as a sediment trap until reservoir sediments has been stabilized. This plan may be impractical due to the repeated inundation of the reservoir discussed above. The Revised DEIS must propose a practical decommissioning plan and schedule for sediment removal and/or stabilization in order for reviewers to comment meaningfully upon the construction sequence.

COMMENT CD-24 Elwha, Spoil and Rubble Disposal

Reference: Appendix A, page A-52.

JR-44 The DEIS does not assess the spoil disposal site and measures to control silt, runoff, and other impacts. The Revised DEIS must describe impacts relating to upland disposal and include costs for mitigating these impacts in the cost estimates.

COMMENT CD-25 Glines, Labor Cost

JR-45 Reference: Appendix A, page A-53.

See comments (Comment CD-10) on Elwha relating to Table A-2, page A-55, concerning labor cost rates.

COMMENT CD-26 Glines, Construction Diversion

JR-46 Reference: Appendix A, page A-53 through A-56.

Comments on the risks of the Lake Aldwell lake tap and lack of an operating plan for the process also apply to the Glines Canyon Project (see Appendix 1 of these comments).

JR-43: The removal of the projects has been accelerated in order to minimize the impact on downstream fisheries during the removal of the projects. To accomplish this objective, the dam would be lowered during the evacuation of the reservoir.

JR-44: Comment noted; see revised Sections 4.2.5.1 and 4.2.5.2.

JR-45: Refer to response JR-30.

JR-46: See response JR-32. The same response applies to river diversion at the Glines Canyon project.

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COMMENT CD-27 Glines, Sediment Management

Reference: Appendix A, page A-56 through A-59.

JR-47 Comments on the sediment stabilization for Lake Aldwell apply equally to Lake Mills. Reinundation of the reservoir during flood events, slope stability, and probable failure of the revegetation program are in serious problems. The Revised DEIS must provide a practical plan for sediment stabilization in Lake Mills.

COMMENT CD-28 Glines, Diversion Canal

Reference: Appendix A, page A-55 through A-59.

The unique feature of the proposed scheme of sediment management for Lake Mills is the diversion canal. The DEIS proposes the diversion of 1000 cfs around the reservoir area to reduce the turbidity of the downstream waters during construction. The DEIS scheme may work during the summer season when flows are low. According to staff, the diversion structure in the river at the upper end of Lake Mills would be an earthfill structure. The existence of a spillway or control gates in the earthen dam or the canal headworks is not defined. The DEIS states that the dam would not be designed to pass flood flows and that the dam would fail in flood situations. It is apparent therefore, that during high flows, when turbidity is highest and large amounts of sediment are mobilized and being transported, that, the diversion canal would not

JR-48 function. Replacement of the diversion dam would be required after each winter flood season.

The design of the diversion canal is vague. As shown on drawings (page A-58), the canal is constructed within the reservoir boundary. The materials in this area are subject to slide failures. Provisions for canal crossings of side streams, such as Boulder Creek, are not defined. The canal alignment traverses steep terrain. No provision for flumes or stability enhancements in these steep areas has been included.

From an engineering viewpoint, it is obvious that the canal slope must be at least equivalent to the gradient of the river (about 0.001). Velocities in the canal will be about 6 fps, well above that allowable for a canal constructed in native materials. Concrete lining may be required for a considerable extent of the canal. In addition, if the canal grade is low enough to prevent scour in the canal, a structure will be required to link the canal to the power tunnel. In addition, considerable energy must be dissipated before the diverted flow can be introduced into the river below Glines Canyon Dam.

The Revised DEIS must include the costs of reconstructing the diversion dam, control structures, plus the cost for canal lining, flumes, and energy dissipation structures. The Revised DEIS must propose a practical plan for diversion, canal construction and energy dissipation.

JR-47: See response JR-14.

The same response applies to sediment stabilization at Lake Mills.

JR-48: An additional assessment of the value of the diversion canal has led to its elimination as part of the diversion plan.

COMMENT CD-29 Glines, Removal of Facilities

Reference: Appendix A, page A-60.

JR-49 The DEIS cost estimate for the removal of the Glines Canyon Dam appears to be low (Table A-22, page A-101). The dam is located in an inaccessible river gorge. Material blasted from the dam will fall into this gorge. The cost to remove all the debris and restore this section of the river has been under estimated. The DEIS does not provide details of an actual removal plan so a review of the cost estimates is not possible. The Revised DEIS must provide a practical decommissioning plan, schedule and costs.

COMMENT CD-30 Glines, Construction Sequence

Reference: Appendix A, page A-60 and A-61.

JR-50 The construction sequence is based on controlled draining of sediments in order to maintain their stability. The DEIS notes that frequent and long duration inundation of the reservoir are possible each winter. Addendum 1 of FERC's letter of May 10, 1991 provides their analysis of this issue. The Applicant's Appendix 1 indicates that inundation may be more frequent than FERC predicts and for longer periods. Construction scheduling and the entire plan proposed by the DEIS may be impractical due to the repeated inundations. FERC must propose a practical decommissioning plan before meaningful comments can be made.

COMMENT CD-31 Glines, Spoil and Rubble Disposal

Reference: Appendix A, page A-61.

JR-51 The DEIS does not address the impacts of upland spoil disposal sites. Cost estimates do not include costs of mitigation, site restoration and stabilization of these sites. FERC must address the requirements for upland disposal.

JR-49: Comment noted. The removal cost has been slightly modified (Appendix A), and the staff believes it to be representative of the cost that would be incurred to remove all of the project features.

JR-50: Under the modified diversion plan outlined in responses JR-5 and JR-14, inundation of the reservoir would be eliminated.

JR-51: Sections 3.1.6, 4.2.5.1, and 4.2.5.2 have been modified to address impacts of spoil disposal sites. The cost estimate (Appendix A, Table 1-19, FERC Acct. No. 332) includes the cost of site restoration and stabilization of the disposal sites.

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COMMENTS OF JAMES RIVER II, INC.

COMMENT GSR-1 Estimated Bedload Transport

Reference: Sec 3.2.12, page 3-20 "The total estimated volume..." and Sec 4.1.1.2, page 4-2 "Delivery of reduced..."

JR-52 The DEIS estimates pre-project total sediment load and bedload transport rates for the Elwha River and suggests bedload supply has been reduced from 150,000 cubic yards per year prior to dam construction to 2,400 cubic yards per year currently. Total load is estimated at 230,000 cubic yards per year (based on Table C-2 and a total watershed area of 269 square miles). These revised numbers are used to make assumptions regarding the influence of the dams on Ediz Hook. The estimate of bedload supply of 150,000 cubic yards per year seems extremely high when compared to the total load of 230,000 cubic yards per year. These numbers suggests bedload comprises over 65 percent of the total load of the river. Bedload in gravel-bedded rivers such as the Elwha is normally closer to 10 percent of the total load. It appears that the bedload estimate was determined from the amount of boulders, gravel and sand accumulated in Lake Mills, although it is not clear from the report. While there is no doubt that cobbles, gravel, and some portion of the coarse sand travel as bedload and would contribute to the beaches down-drift from the Elwha, medium and fine sand would move primarily as suspended load and would not be stable in the high energy environment on the beaches or Ediz Hook. These fine-grained sediments would be carried off shore. If bedload is determined as the volume of cobble, gravel, very coarse, and coarse sand, one arrives at 70,000 cubic yards per year. This number, while still high (30 percent of the total load) seems more realistic than the 150,000 cubic yards per year determined by FERC staff. The Revised DEIS must revise the estimates of bedload.

COMMENT GSR-2 Woody Debris - 1

Reference: Sec 3.2.5, page 3-7.

JR-53 The DEIS states that the reservoirs store large wood debris. The dams do not store all woody debris. As debris accumulates, it is directed over the spillways into the downstream channel during high flow events. FERC should correct this error and discuss the net debris balance (see GSR-4).

COMMENT GSR-3 Pre-project Sediment Load

JR-54 Reference: Sec 4.1.12, page 4-2, "The natural upstream..."

See Comment GSR-1.

RESPONSES TO JAMES RIVER II, INC.

JR-52: The text in Sections 3.2.1.2 and 4.1.1.2 has been revised. Corps sampling along the coastal zone indicates boulder through sand-sized material is present in the nearshore zone. The sand-sized material transported by the Elwha River to the coastal zone is sometimes fully suspended, sometimes partially suspended, and at other times becomes part of the bedload transport. The values for material available for longshore transport presented in the EIS include all the sand sizes, not only those commonly moved as bedload; therefore, the use of the word "bedload" in the DEIS was confusing. See responses DOI-118 and DOI-48.

JR-53: The text has been changed in Section 3.2.5.

JR-54: Comment noted.

COMMENT GSR-4 Woody Debris - 2

JR-55 Reference: Sec 4.1.1,.2 page, 4-2, 1st para.

The DEIS is in error in assuming that the reservoirs are long term traps for large wood debris. Woody debris is passed downstream over the dams. Video tape and photographs support this observation. The Revised DEIS must correctly report the passage of large woody debris.

COMMENT GSR-5 Bedload Transport Rate

Reference: Sec 4.1.1.2, page 4-2.

JR-56 The DEIS estimates that Elwha River bedload transport rate is 150,000 cubic yards per year. Elsewhere in the DEIS it is estimated to be about 230,000 cubic yards per year. It is unrealistic for bedload to be 65% of total load. Most gravel-bedded rivers transport closer to 10% of the total load as bedload. The FERC should clarify whether this is a terminology problem or an overestimation of bedload transport rates (see GRS-1).

COMMENT GSR-6 Drawdown Increases Turbidity

Reference: Sec 4.1.1.2, pages 4-9 to 4-10.

JR-57 During the 18-foot drawdown experiment in Lake Mills, in 1990, no noticeable increases in turbidity occurred in the river. What is the basis for the conclusion that 10-foot drawdowns would increase turbidity?

COMMENT GRS-7 Erosion and Sediment Control Plan

Reference: Sec 4.1.1.3, page 4-3.

JR-58 In the DEIS, the staff recommends that the Applicant prepare an Erosion and Sediment Control Plan yet ignores this requirement for the dam removal option. The Revised DEIS should address this requirement for each alternative.

COMMENT GSR-8 Elwha, Correct Figure References

JR-59 Reference: Sec 4.2.1, page 4-74, 2nd para, "Storage and reduced erosion..."

The DEIS cites Figures A-29 and A-33. Should the figures references be A-31 and A-35?

JR-55: The text has been changed in Section 4.1.1.2.

JR-56: The DEIS did not estimate the bedload transport to be 150,000 cubic yards per year (see response JR-52). This was a terminology error. Bedload transport of the Elwha River is probably in the range of 5 to 15 percent of the total load. See response JR-52 and DOI-48.

JR-57: The basis of the Commission comment referred to in the DEIS was based on the Commission staff's observations of high bedload and suspended load transport rates during the Lake Mills delta drawdown test, and wave-induced shoreline erosion, both of which increased Lake Mills turbidity. Some downstream turbidity would be expected with increased lake turbidity.

JR-58: The staff recommends an erosion and sediment control plan for all of the alternatives in the DEIS. For the removal alternative, the plan is described in Section 4.2.1.3.

JR-59: The DEIS figure references should be Figures A-31 and A-35.

COMMENT GSR-9 Elwha, Lower River Aggredation

Reference: Sec 4.2.1.2, page 4-83, 4th para, "Increased sediment transport..."

JR-60 The DEIS states that there may be 1 to 5 feet of aggredation in the lower river. Simon & Lee (1989) estimated as much as 10 feet. The Revised DEIS must explain how aggredation will impact the existing Ranney Well, fish holding and spawning areas, and Lower Elwha Tribal Hatchery water supply and how it will impact aquatic insect production, rearing habitat and food for juvenile salmonids. The Revised DEIS must contain sufficient analysis to support analysis of fisheries and water supply impacts.

COMMENT GSR-10 Sediment Supply to Ediz Hook

Reference: Sec 4.2.1.2, page 4-84.

JR-61 The DEIS states, "bedload sediment supply would be returned to the coastal zone and begin to contribute to the Ediz Hook supply rate within 10 to 20 years?" A COE report on Ediz Hook states, "Elwha River bedload has not been significant to the Hook growth....despite the fact that the Elwha bedload was reduced in 1910, growth of the Hook did not decline until the late 1940's" (COE, 1971). This indicates that it would likely take at least 40-50 years for any increases in Elwha bedload to effect the Hook.

There is no basis for the statement, "Eventually, beach nourishment of the Ediz Hook area would no longer be needed." The 1971 COE report indicates wave transport capacity along Ediz Hook is 270,000 cubic yards/year. In addition, 200,000 cubic yards per year is transported offshore to an accretion area just west of the base of the Hook. If, in fact, the Elwha were to supply 150,000 cubic yards per year to the area, it would not exceed the wave transport capacity, let alone the offshore transport capacity. There is no reason to think that the beach nourishment program would no longer be needed if the dams were removed. The Revised DEIS must correct this analysis.

COMMENT GSR-11 Suspended Sediment after Dam Removal

Reference: Sec 5.2.1, page 5-9, para 3, "With removal of..."

JR-62 The DEIS states "an increase in clay and silt suspended sediment discharge would be expected in the middle and lower Elwha River reaches during the latter 3 to 4 years of the dam removal process and several years thereafter." The Revised DEIS should more accurately comment, "high levels of clay and silt suspended sediment discharge would be expected in the middle and lower Elwha River reaches during the lake drawdown and sediment stabilization process (4 years) and for 4 to 10 years thereafter. In addition, large amounts of silt and sand would enter the river channel from the storage terraces in the reservoirs for 4 to 10 years following dam removal."

JR-60: The draft Simon and Lee (1989) report was not submitted to the Commission in final form; however, it was reviewed. It contains one of the removal options that was assessed by the Commission staff (see responses SOW-102 and SOW-117). It presents uncontrolled reservoir lowering and the resulting sediment erosion. Downstream impacts are greater because more sediment is allowed to move out of the reservoir in a shorter time frame. The HEC-6 model results presented in the FEIS is one example of the range of conditions analyzed for the FEIS.

JR-61: See response COE-31.

JR-62: Comment noted.

G. WATER QUALITY

1. The Draft EIS Fails to Evaluate the Application of Federal and State Laws Protecting Water Quality

JR-63

The DEIS acknowledges that "construction and subsequent removal of the Elwha and Glines Canyon dams would result in adverse impacts to the water quality of the Elwha River." (DEIS, page 4-86.) Despite this finding, the DEIS fails to evaluate the application of federal and state laws governing water quality and pollution prevention. Under these laws, various certifications and permits would be required before the dams could be removed. Accordingly, the DEIS should consider application of these laws to the dam removal alternative.

Section 401 of the Clean Water Act, 33 U.S.C. § 1251 et seq., requires a certification from the designated state agency that discharges, such as those that would occur in conjunction with the dam removal alternative, comply with various provisions of the Clean Water Act. 33 U.S.C. § 1341. Construction and subsequent removal of the dams will result in the discharge of high concentrations of reservoir sediments stored behind the dams into the Elwha River. (DEIS, page 4-87.) In addition, construction impacts would introduce concrete wastes into the Elwha River. (DEIS, page 4-87.) Accordingly, any applicant for a permit or license to remove the dams would appear to be required to obtain certification from the State of Washington that such discharge complies with the relevant provisions of the Clean Water Act.

RCW 90.48.260 authorizes the Department of Ecology to issue Section 401 certifications. Pursuant to the Clean Water Act, Washington State has promulgated its own Water Quality Standards, WAC 173-201. The Water Quality standards classify surface waters of the state and establish water quality criteria for each classification. The Elwha River is classified as "AA" or "extraordinary." WAC 173-201-080(38). Effluent limitations may be necessary to protect the water quality standards established for the Elwha River, including turbidity, biological oxygen degradation, and deleterious material concentrations. WAC 173-201-045.

The Clean Water Act also prohibits the discharge of any pollutant into the navigable waters of the United States absent a permit. 33 U.S.C. § 1311(a). Pursuant to Section 402(b) of the Clean Water Act, Washington State has established a state National Pollutant Discharge Elimination System ("NPDES") Permit Program, WAC 173-220. WAC 173-220-020 provides:

> No pollutants shall be discharged to any surface water of the state from a point source, except as authorized by an individual or general permit issued pursuant to this chapter.

JR-63: Comments noted. Sections 4.2.2.1 and 4.2.2.2 further identify potential violations of state water quality criteria under the dam removal alternatives. The staff recognizes the need for state certification for construction activities required under dam removal with respect to Section 401 of the Clean Water Act. However, the State of Washington Department of Ecology has indicated that with respect to Section 401 certification, short-term modifications of water quality standards can be allowed for water quality conditions which are expected to be corrected over time. Turbidity values would ultimately assume natural background levels following dam removal and would technically not violate state water quality criteria, which are based on exceedance of these levels for Class AA waters. The applicability of NPDES Permit requirements towards dam removal is currently being reviewed by state water quality authorities.

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"Pollutant" is defined as:

> dredged spoil, solid waste, . . . biological materials, . . . heat, . . . rock, sand, cellar dirt and industrial, municipal and agricultural waste discharged into water.

WAC 173-220-030(19). "Pollutant" does not include dredged or fill material discharged in accordance with a permit issued under Section 404 of the Clean Water Act. Sediment and concrete waste constitute "pollutants" under the NPDES Permit Program, unless they are characterized as dredge or fill material and permitted under Section 404.

"Point Source" is defined as:

> any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, . . . from which pollutants are or may be discharged.

WAC 173-220-030(18). The discharge of suspended sediment loads into the Elwha River will occur from a point source--the reservoir in which the sediments are not trapped. Concrete wastes will also be discharged from a point source--the equipment used to dismantle the dams. Accordingly, the NPDES Permit may be required because removal of the dams will result in the discharge of pollutants into the Elwha River from a point source in violation of WAC 172-220-020.

JR-63 cont'd

The NPDES Permit must ensure compliance with "all known, available, and reasonable methods of treatment" required under RCW 90.52.040, 90.54.020(3)(b), and 90.48.520. WAC 173-220-130(a). In general, these statutes require wastes and other substances to be treated by all known, available, and reasonable methods prior to their discharge into waters of the state, regardless of the quality of the water into which such wastes will be discharged and regardless of the minimum water quality standards established for said waters. The NPDES Permit must also ensure compliance with all effluent limitations established under Sections 301, 302, 306, and 307 of the Clean Water Act. WAC 173-220-130(a).

Alternatively, if the sediments and/or concrete wastes are considered dredge or fill material, a permit may be required under Section 404 of the Clean Water Act, 33 U.S.C. § 1344. Section 404 requires permits for the "discharge of dredged or fill material into navigable waters at specified disposal sites." 33 U.S.C. § 1344(a). "Dredged materials" means "material that is excavated or dredged from waters of the United States." 40 C.F.R. § 232.2(g). The removal of the dams may be considered to include the discharge of excavated and dredged material into the Elwha River. The DEIS reports that "suspended sediment concentrations would be substantially increased in the Elwha river . . . during excavation and stabilization of the river channel in each reservoir, and during periods of high flow in the late fall and early winter." (DEIS, page 4-85.) Accordingly, a Section 404 permit would likely be required from the Corps of Engineers.

In addition, a Section 404 permit may be required due to the discharge of fill material into the Elwha River. "Fill material" means "any 'pollutant' which replaces portions of the 'waters of the United States' with dry land or which changes the bottom elevation of a water body

for any purpose." 40 C.F.R. § 232.2(i). "Pollutant" is not defined in the regulations promulgated by the Corps of Engineers, but is defined in the Clean Water Act as "dredged spoil, solid waste, . . . rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water." 33 U.S.C. § 1362(6). "Discharge of fill material" means "the addition of fill material into the waters of the United States. The term generally includes . . . dams and dikes." 40 C.F.R. § 232.2(f). Sand, concrete, and other materials used in the construction of the Elwha and Glines Canyon dams may constitute fill material, necessitating a Section 404 permit.

JR-63 cont'd

RCW 90.48.080 prohibits the discharge of any organic or inorganic matter into the waters of the state that causes or tends to cause pollution of such waters. Accordingly, the State of Washington has established a State Waste Discharge Permit Program to regulate wastes that do not fall under its NPDES Permit Program. WAC 173-216 et seq. The State Waste Discharge Permit Program provides that "no waste material may be discharged from any commercial or industrial operation into waters of the state" without a State Waste Discharge Permit. WAC 173-216-040(1). The DEIS fails to consider whether the removal of the dams constitutes an industrial operation and whether a Washington State Waste Discharge Permit will be required.

2. The DEIS Fails to Adequately Evaluate the Water Quality Impacts of Dam Removal on Downstream Water Users

The DEIS does not adequately address the impacts of dam removal on downstream water users. The Elwha is presently classed by the state Water Quality standards as Class AA, Extraordinary (WAC 173-201). This classification identifies its high quality and indicates its suitability for use as a water supply with only minimum treatment. The Elwha River is used by the City of Port Angeles for its potable water supply. The City also supplies the Daishowa Mill, the ITT Rayonier Mill and the WDF Chinook Rearing Channel with water from the River. The Dry Creek Water District also takes its water from the River.

JR-64 The dam removal alternative would have significant adverse impacts upon water quality and hence public water supplies. Whether these impacts are short or long term, the initial period of adverse conditions is longer than any of the users could tolerate and the risk of stabilization schemes failing would be sufficiently high to require protection of water supplies in any event. The City of Port Angeles and the Industrial users have estimated that the capital costs to protect water supplies would be $35,700,000 and the annual O&M would be $2,762,000. (See comments on the DEIS submitted by the City and by Daishowa America.)

State Water Quality standards are very specific with respect to permissible project-caused excursions from the existing conditions. The DEIS describes conditions for turbidity, suspended solids and for bedload that are beyond acceptable limits (Section 4.2.2). Clearly dam removal would cause significant and long term Water Quality violations. The DEIS does not explain how the Washington Department of Ecology (WDE) or the Environmental Protection Agency would enforce their water quality requirements. It is reasonable to expect, however, that they would

JR-64: Comments noted. Sections 4.2.2.1 and 4.2.2.2 provides more detailed descriptions of water quality impacts resulting from dam removal and proposes mitigation measures to minimize these impacts on residential and industrial water users and the WDF fish-rearing facility. Capital expenditures and O&M costs of staff-recommended mitigation measures are also provided in the FEIS. These staff-recommended measures are addressed in the responses DAC-5 and DAC-6.

With respect to violation of state water quality standards, potential violations of state water quality criteria under the dam removal alternatives are described in greater detail in revised Sections 4.2.2.1 and 4.2.2.2.

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require all practical measures be used to minimize violations. The Revised DEIS must address these issues, and must identify the cost implications, including identification of who would be expected to bear the cost protecting downstream water supplies.

JR-64 cont'd

Adverse water quality conditions during and just following dam removal would threaten existing fish stocks on the lower river (see Comment FR-20 & 21). The state Water Quality standards provide protection to natural ecosystems as well as human needs. The state and FERC have a responsibility to protect natural ecosystems by the consistent application of Water Quality Standards. On other smaller projects in the Northwest, FERC, WDE and WDF have required the execution of site specific studies in order to develop site specific Erosion and Sediment Control Plans for the protection of water quality and aquatic habitat. FERC must adhere to the same standard in assessing their dam removal scenario.

The Revised DEIS must describe the extensive Water Quality violations associated with the dam removal alternative and describe the regulatory, engineering and environmental actions required to protect water quality. Plans and their costs must be included in the Revised DEIS if the public and other reviewers are to understand the true implications of dam removal.

3. Water Quality Comments

COMMENT WQQ-1 Water Quality, Resource Objective

Reference: Sec 1.4, page 1-5, 1st para, "The Commission staff..."

JR-65 The DEIS identifies three principal resource objectives. Water quality and supply should be included as a fourth resource objective. 173-201 WAC codifies what is essentially a comprehensive plan for water resources in Washington State. 173-201 WAC identifies public water supply as a major use of surface waters and classifies Elwha waters as AA, (extraordinary) suitable for use as a public water supply. The Elwha River currently supplies municipal and industrial water. The Revised DEIS should include water quality, particularly for public water supply as a principal resource objective.

COMMENT WQQ-2 Location of the Ranney Well

JR-66 Reference: Sec 3.3.2, page 3-23, 1st para, "Existing water rights..."

The DEIS states that the Ranney Well collector is located at the WDF Rearing Channel intake. This is in error. Its location should be corrected to be the outlet of the rearing channel.

COMMENT WQQ-3 Elwha, Run-of-River Operation

Reference: Sec 4.1.1, WQ, page 4-3.

JR-67 The DEIS comments "Departure from run-of-river operation of Lake Mills and Lake Aldwell would also occur..." Lake Aldwell does not depart from a run-of-river operation. The Revised DEIS should correct this statement.

COMMENT WQQ-4 Glines, Drafting Lake Mills

Reference: Sec 4.1.2.2, page 4-4, 2nd para, "Drawdown and filling..."

JR-68 The DEIS states that "Drafting of Lake Mills would result in lower than normal discharges during peak flow periods." The Revised DEIS should be corrected to state that <u>during the first several hours</u> of peak flow periods there may be reduced flows if Lake Mills is not at full pool.

JR-65: Refer to responses ITT-25 and ITT-26.

JR-66: Comment noted. Section 3.3.2 has been revised to correct this error.

JR-67: Comment noted. Section 4.1.2.2 states that Lake Aldwell would not depart from "run-of-river" operation. Further, the EIS has also been corrected to state that Lake Mills does not operate in a "run-of-river" mode, as erroneously stated in the DEIS.

JR-68: Comment noted. The staff recognizes that because of limited storage provided by Lake Mills 10 feet below full pool, peak flows would be relatively unaffected by project operation.

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COMMENT WQQ-5 Dry Lower River Bed

JR-69

Reference: Sec 4.1.2.2, page 4-5, 3rd para, "Only a 0.2 mile..."

The DEIS states that parts of the lower River may be dried up at low flows. The Applicant is not aware of any records indicating a totally dry river in the reach between the industrial water line intake and WDF channel water outlet. The Revised DEIS should remove this statement unless there is evidence of the river being "dried up."

COMMENT WQQ-6 WDF Rearing Channel, Water Use

JR-70

Reference: Sec 4.1.2.2, page 4-5, 2nd para, "There are currently..."

Current practices at the WDF rearing channel do not include using the full 50 cfs and consumption may be substantially less than 50 cfs if the rearing channel is not in use during late summer and fall. The Revised DEIS should report current and project water use by month.

COMMENT WQQ-7 Flow Augmentation

JR-71

Reference: Sec 4.1.2.2, page 4-4, 1st para, "With the Applicant's..."

The flow augmentation request by WDF was directed toward improving conditions during the fall chinook spawning period in September and first part of October. Later in the year with decreasing insolation and air temperatures, WDF felt that temperature stress would not be as significant a factor for coho runs.

COMMENT WQQ-8 Glines, Lake Mills Dissolved Oxygen

JR-72

Reference: Sec 4.1.2.2, page 4-7, 4th para, "Flow augmentation from..."

The Revised DEIS should report whether Lake Mills dissolved oxygen falls below State Water Quality Standards.

COMMENT WQQ-9 Hazardous Waste Control Plan

JR-73

Reference: Sec 4.1.2.3, page 4-11.

The Revised DEIS should describe a Hazardous Waste Control Plan and include additional cost for hazardous materials control plan in the cost estimate.

JR-69: The staff recognizes that drying of the lower river has not been documented. However, it is apparent that given a full demand for the 205 cfs in water rights existing for the river when combined with extremely low discharge values which were observed to fall below 200 cfs in 1987 that flows could reach extremely low levels. The Washington Department of Ecology has recently informed the staff that under current water demand, total diverted flow would not be expected to exceed 176 cfs. Under future water demands drying of the lower section of the river adjacent to the WDF fish rearing facility is conceivable.

JR-70: Comment noted. The WDF rearing channel is not used when water temperatures become critical. During these periods, water is not diverted though the rearing facility.

JR-71: Comment and additional information noted.

JR-72: Section 4.1.2.2 has been revised to state that under certain conditions, dissolved oxygen values would fall below state water quality standards as a result of flow augmentation measures provided for in the applicant's proposal.

JR-73: Comment noted. Section 4.2.2.1 identifies the need for a Hazardous Waste Control Plan. The details of this plan were not included in the DEIS, although the plan was included in dam removal cost estimates.

COMMENT WQQ-10 State Dissolved Oxygen Standards

Reference: Sec 4.1.2.4, page 4-11.

JR-74 The DEIS does not state what are the consequences of not meeting state water quality standards for dissolved oxygen. It should identify when state water quality standards are violated and address how such standards will be met.

COMMENT WQQ-11 Maximum Water Temperatures

Reference: Sec 4.2.3.2, page 4-104, last para, "There are also..."

JR-75 Average daily temperature maxima is predicted to be reduced by 2-4°C with an increase in daily maxima during low flows to range of 16-20°C. The Revised DEIS should discuss the effect of elevated late summer maximum temperatures upon holding adult salmon, eggs and juveniles.

COMMENT WQQ-12 State Water Quality Standards

Reference: Sec 4.2.2, page 4-85, 1st para, "Suspended sediment concentrations..."

JR-76 The DEIS does not address violation the state water quality standards for the Elwha River. The Revised DEIS should explain how violation of the state water quality standards will be handled.

COMMENT WQQ-13 Cost for Municipal Water Supply

Reference: Sec 4.2.2, page 4-85, 2nd para, "Increased turbidity would..."

JR-77 The DEIS identifies impacts on municipal and industrial water supplies but seriously underestimates the cost of corrective measures. The Revised DEIS should determine real costs for the City of Port Angeles and industrial users and determine who bears these costs for necessary corrective measures. See Section M, Costs of this document. The City of Port Angeles and the industrial users have estimated that protection of water supplies could cost $35,000,000.

JR-74: Violation of state standards for water quality criteria, including dissolved oxygen, under dam removal alternatives are described in greater detail in revised Sections 4.2.2.1 and 4.2.2.2.

JR-75: Section 4.2.2.2 has been corrected to state that maximum daily temperatures predicted under the dam removal alternatives would not exceed values currently existing in the river. Consequently, discussions of elevated temperatures on adult salmon, eggs, and juveniles are not necessary.

JR-76: Violation of state water quality standards for turbidity under the dam removal alternatives are clearly stated in Section 4.2.2.1.

JR-77: Staff has reviewed the commentor's methodology and cost estimate for maintaining the quality of water to the City of Port Angeles and industrial users. While the method would probably work and at the cost proposed, a more cost effective and perhaps superior approach deemed fully adequate and has been utilizing a Ranney well collection and distribution system has been adopted for the FEIS. See Section 4.2.2.3 for a further description of the water supply system.

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COMMENT WQQ-14 Summer Water Temperatures

Reference: Sec 4.2.2, page 4-85, 3rd para, "Water temperatures in..."

JR-78 The DEIS states that there would be a 2° - 4°C reduction in temperatures during summer low flows for average conditions. However, peak daily water temperatures during low flow periods would increase. The Revised DEIS should determine whether daily maximum temperatures would have adverse affects on aquatic insects and fish.

COMMENT WQQ-15 Construction Turbidity Levels

Reference: Sec 4.2.2, page 4-85, 1st para, "Suspended sediment concentrations..."

JR-79 The DEIS states for dam removal, "High turbidity levels would occur for relatively short periods of time, ranging from several hours to many days." In other sections the DEIS stated that turbidity levels of 300-500 mg/l would occur throughout each summer construction season and during winter high flows. Addressing the Applicant's proposed mitigation plan the DEIS states that turbidity levels approaching 1200 mg/l would occur. The dam removal scenario anticipates moving millions of cubic yards of sediments while the Applicant's proposal would take place in a location characterized by a cobble streambed and would cause hardly any fine sediment to move. The DEIS's statements are not consistent. The Revised DEIS should be consistent in determining and discussing turbidity in its assessment of impacts.

COMMENT WQQ-16 Gated Diversion Structure

Reference: Sec 4.2.2.1, page 4-86, 2nd para, "Gated diversion tunnels..."

JR-80 The DEIS identifies a gated diversion structure but does not state its capacity to augment flows. The Revised DEIS should discuss how much capacity would be used and for how may days.

COMMENT WQQ-17 Cost to Maintain Water Quality

Reference: Sec 4.2.2.1, page 4-86, 4th para, "Construction and subsequent..."

JR-81 The DEIS should review its own analysis (Addendum 1 of FERC's Letter of May 10, 1991) and Applicant's Appendix 1 with respect to water quality impacts during decommissioning. Do construction cost estimates in the DEIS include costs for reestablishing roads, restarting erosion and sediment control plans and replanting following each of the refilling events? How many refilling events did the DEIS include for Lake Mills, and for Lake Aldwell? The Revised DEIS should identify the costs for maintaining water quality, whether

JR-78: Refer to response JR-75.

JR-79: Section 4.2 has been revised to eliminate inconsistencies in predicted suspended sediment and turbidity values among project alternatives.

JR-80: Under the refined diversion plan discussed in response JR-5, reservoir pool stability would be maintained by way of the notched dam. The capacity of the diversion tunnels would be restricted to that which would normally not allow flow velocities in excess of 30 fps. Higher flow velocities could be accommodated for infrequent events if desired.

JR-81: Because the revised diversion scheme stabilizes reservoir pool elevations, costs associated with rework due to inundation of the reservoirs have been eliminated.

Comments noted. Comments regarding violation of state water quality standards have been addressed in responses JR-74, JR-75, and JR-76.

JR-81 cont'd decommissioning would violate state water quality standards, what actions would be required to minimize violations, and what administrative process would be used if violations occur.

COMMENT WQQ-18 Suspended Sediment During Dam Removal

Reference: Sec 4.2.2.1, page 4-87, 3rd para, "Incision, bank degradation..."

The DEIS states, "High suspended sediment loads would be transitory in nature, and would be sustained for a period of time ranging from several hours to several days. High turbidity levels would occur during the initial release of water from the diversion tunnel at Lake Mills and Lake Aldwell, during initial and final drawdown of each reservoir, and during fall and winter storms immediately following each summer construction period." This is in direct contradiction to the next paragraph, "Based on the HEC-6 model predictions (Section 4.2.1), suspended sediment loads of 300 to 500 mg/l would be expected to occur throughout the summer construction period. These values for suspended sediment concentration would also apply to peak winter storm runoff periods during the 5-year dam removal period. Suspended sediment loads would remain consistently high in the Lake Mills, the middle river, Lake Aldwell, and lower reaches of the river." FERC should be consistent in its analysis of impacts.

JR-82 On page 4-12, the DEIS says "Alabaster and Lloyd (1982) found that a concentration of 200 to 1,000 mg/l suspended sediment concentrations could induce direct mortality of fish, if exposure were for weeks or months." However, on page 4-94, in discussing Direct Sediment Effects on Fish, the DEIS states, "Sediment concentrations between 300 and 500 mg/l would be present only for a few days at a time. Both of these normally expected concentrations would be acceptable to fish if they were not persistent." This statement is in direct contradiction to the HEC-6 model which predicts concentrations between 300 and 500 mg/l throughout the April-October construction period (for at least the 4 years of construction, and probably longer).

Based on the results of the sediment modelling, direct fish mortality can be expected throughout the river downstream of Lake Mills from April through October for 4 consecutive years. This will cause severe impacts to both adult and juvenile anadromous and resident fish populations. FERC should apply consistent standards in assessing sediment impacts. The Revised DEIS should identify what provisions are necessary to sustain fish populations during the construction period so that there will actually be some fish left to restore following removal of the dams.

COMMENT WQQ-19 Ammonia and Hydrogen Sulfide

JR-83 The DEIS does not address the water quality impacts of excavating or eroding lake sediments. It is likely that sediments in Lake Mills and Lake Aldwell contain organic material and that there has been anaerobic decomposition. Fathometer traces were not practical for sub-

JR-82: Comment noted. The text has been expanded in Section 4.2.2.1. Inconsistencies in predicted suspended sediment and turbidity values among different sections of the DEIS have been corrected. See Section 4.2.3.1 for effects to fisheries.

JR-83: Hydrogen sulfide would not be expected to present a problem because of the oxygen content of water in the river. Rapid reaeration of water released from the reservoirs due to river turbulence would rapidly reduce hydrogen sulfide concentrations to zero. Ammonia could potentially impact fish and invertebrates in the reservoirs during dam removal. However, ammonia levels would rapidly decline in the river due to uptake by aquatic algae. Moreover, because pH values in the Elwha River are relatively neutral, the non-ionic form of ammonia, toxic to aquatic life, would remain in relatively low concentrations. Effects of methane on aquatic life and water users would be expected to be minimal because it would be rapidly released from water downstream of each reservoir.

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JR-83 cont'd bottom profiling because of the opacity of sediments due to gases trapped in the sediments. When these sediments are mobilized, either by excavation or erosion, it is possible that ammonia, hydrogen sulfide and methane will enter the water. The Revised DEIS must assess the water quality impacts of ammonia and hydrogen sulfide upon domestic and industrial water supplies and upon aquatic life, especially benthic insects and incubating salmon eggs.

COMMENT WQQ-20 Trihalomethanes

JR-84 The DEIS does not address the risk to public water supplies if excavation or erosion of sediments in Lake Mills and Lake Aldwell mobilizes fine organic matter into the water column. Higher levels of suspended sediments and of organic matter will require higher levels of chlorination by the City of Port Angeles in order to achieve required levels of disinfection. This may result in the formation of trihalomethanes, a known carcinogen. The Revised DEIS should address the risks, and costs, to the public water supply caused by increased chlorination.

JR-84: This concern is addressed in Sections 4.2.2.1 and 4.2.2.2. However, formation of trihalomethanes and other halogenated organic compounds is likely to be minimal, because of the dilution of dissolved and particulate organic matter provided by subsurface waters surrounding the City's Ranney collectors.

H. FISHERIES RESOURCES

1. Introduction

JR-85 Although not explicitly stated, the DEIS partitions the fisheries discussions into two general categories: 1) the feasibility of restoration (will it work), and 2) the results of successful restoration in terms of the numbers of fish produced (how many fish will there be). James River believes the DEIS provides a reasonable analytical approach to addressing the first issue, the feasibility of restoration. However, some significant errors were made which cause many of the conclusions in the DEIS to be incorrect. Furthermore, the discussions regarding the numbers of fish to be produced, and the harvest management required to achieve Maximum Sustained Yield (MSY), are wholly inadequate. Many significant aspects of the issue are ignored completely, and where analyses were attempted, serious errors were made. The result is that the fisheries results of dam removal and dam retention are seriously misstated. Reviewers are left with the impression that dam removal will definitely result in restoration of all species, and that the numbers of fish produced will be considerable. Conversely, the fisheries results of dam retention are reported to be minimal. Neither conclusion is correct.

James River's comments will follow the conceptual approach provided in the DEIS. The feasibility of restoration will be addressed first, with comments specifically directed at Sections 4.1.3.2 (Long-term Impacts of the Dam Retention Alternative) and 4.2.3.2 (Long-term Impacts of the Dam Removal Alternative) of the DEIS. Next, the numbers of fish to be produced under each scenario will be examined, as well as a discussion of the near-term (five to fifteen years) and long-term (fifteen years and beyond) harvest management implications of restoration. Because the DEIS does not contain any section dealing specifically with these latter three issues, James River's comments can be viewed as expansions of the DEIS; the Revised DEIS must be modified to include sections on these topics. To provide the necessary technical expertise, James River engaged Natural Resource Consultants (NRC) and Gary Morishima to provide a detailed analysis of the adult production capacity of the Elwha, and the harvest management restrictions which would be required to achieve restoration. Their report is contained in this document as Appendix 2 (NRC 1991) and will be referenced extensively in the comments James River provides below.

2. Feasibility of Restoration

JR-86 Comments on:

Section 4.1.3.2: Long-term impacts of Dam Retention Alternative (Page 4-12), and
Section 4.2.3.2: Long-term impacts of Dam Removal Alternative (page 4-95)

JR-85: The main evaluation criteria, your item number 1—Will it work?—was thoroughly analyzed and discussed. Item number 2—How many fish will be produced?—was, based on scoping document comments, a secondary concern. As a secondary concern, it was given less weight in the analysis. Any estimate of future fish production relies on many assumptions that cannot be determined until the action is taken. Considering these limitations, the staff believes the presented estimates are reasonable. The details of the methods are presented in response JR-228. Some errors were made that have been corrected. However, some estimates were perceived as errors but were not; instead, they were a conservative approach to applying MSY methods to stocks in the system. The staff believes that "significant aspects" were addressed at an appropriate level and that no serious errors were made.

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James River wishes to provide comments on these two sections together in order to contrast the feasibility of restoration under the dam retention and dam removal alternatives.

Approach (as summarized in DEIS starting on page 4-12):

The DEIS outlines a reasoned approach to evaluating the feasibility of restoration under both the with and without dams scenarios. The basic "work product" of the approach, Tables 4-4, 4-17, and 5-3 (DEIS pages 4-14, 4-98 and 5-6, respectively) provides a good short-hand method for summarizing the restoration analysis for the two scenarios. However, two problems evident in the DEIS should be corrected. First, some adjustments to the evaluation criteria are appropriate to provide a more realistic comparison of the with and without dams scenarios. Second, the evaluation criteria used to develop Tables 4-4 and 4-17 are not always consistently applied. The result of these two problems is that the potential benefits of restoration via dam removal are overstated compared to restoration with the dams in place. In the following comments, James River will seek to correct the problems noted above, and will suggest related adjustments to Tables 4-4, 4-17 and 5-3.

JR-86 cont'd

The DEIS provides four "main elements" for assessing restoration potential (page 4-13): (1) passage, (2) fishery harvest, (3) habitat, and (4) availability of a native stock of fish for a restoration program. James River generally agrees with these four elements, but believes a fifth must be added: (5) risks of implementation.

All parties have recognized the environmental risk represented by the sediment stored behind the dams. The DEIS indicates that even if sediment stabilization goes according to plan, "Dam removal would increase lower and middle river suspended sediment for a period of up to 7 to 9 years, which would have moderate to severe effects on fish and their habitat."(DEIS page 4-94) Further, "The WDF chinook salmon rearing channel may be unusable during the 5-year construction period and up to 2 years thereafter because of sedimentation and high turbidity" (DEIS page 4-95). Finally, "During the 5-year construction [dam removal] period, passage for both adult and juvenile anadromous fish would be impeded, delaying anadromous fish restoration for at least 5 years." (DEIS page 4-93)

In other words, for a period of at least 5 years, the habitat used by wild stocks will be severely degraded, the hatcheries supporting the artificial stocks may be unusable, and the upper watershed will remain closed to anadromous fish. It appears that the existing stocks may not be available for restoration after this period.

These circumstances obviously have a central bearing on the feasibility of restoration (the DEIS repeatedly stresses the importance of using existing, Elwha-adapted stocks in the restoration effort) and risk therefore must be included in the restoration analysis. This element should be given ratings of "Favorable", "Marginal", etc. on a stock specific basis, depending on the life history characteristics of each stock and the anticipated changes in the lower river.

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JR-86: The staff sees no reason to add the risk category to the evaluation. The period of impact has been revised and additional mitigation added to some of the lower reach impacts. Also, a restoration plan (Appendix A, Part 3.3) describing a restoration plan for dam removal has been added.

The staff does not believe combining "passage" and "harvest" as one factor is appropriate. Passage survival does affect harvest, but passage losses, independent of harvest, add additional risk to restoration and reduce production of the stock. Both factors should be kept at a minimum to restore stocks.

On a theoretical basis, stock recruitment curve relationships change with dam retention or dam removal; however, other factors were considered more important in deciding not to implement a different curve between the two. First, the true stock recruitment curve is unknown and had to be assumed. So changes in this rate could have a larger effect on the conclusion than small adjustments to the curve that would theoretically occur from dam passage mortality. Second, the exact future passage mortality is unknown. Even though the staff has reasonable estimates of passage survival, uncertainties remain. Third, the differences in the final production curves that would be developed for dam removal and for dam retention passage mortality would be small. In general, a modification to the curve, which includes the dam passage mortality effects, would slightly reduce escapement and run size and increase the allowable harvest and harvest rate. The staff believes a conservative approach, considering the various unknowns, to be the best approach. With staff's approach, a greater level of security in both escapement and buffer for harvest rate will help ensure a proper assessment in the light of these uncertainties.

Again, assuming a varied harvest rate, one "optimum" harvest rate for all three reaches is not in the staff's view warranted for the same reason discussed above. Using the characteristics of the upper reach, which would account for about 65 percent to 75 percent of most stocks in the habitat area, is the most warranted. Also, the relative productivity (per unit stream length) of the middle and lower reaches will probably be lower because of lower habitat quality. This lower productivity increases the importance of the upper reach for the system.

James River suggests another refinement. Two of the elements in the DEIS, "passage" and "harvest", should be combined into a single category, "Imposed Mortality". The DEIS provides the rationale for this approach (page 4-16):

"The allowable fishery harvest rate was determined by adjusting the optimal sustained yield harvest rate by the passage factors. Essentially, this entails allocating the optimal harvest rate between passage mortality and fishing mortality."

Simply put, a fish stock producing at Maximum Sustained Yield (MSY) can sustain a given amount of mortality, whether it is imposed as dam passage mortality or as harvest. Therefore, it is most appropriate to consider harvest mortality and dam passage mortality together. If the combination of these two factors can be kept at or below the Optimal Exploitation Rate (OER, as defined in the DEIS), then the Induced Mortality factor would be listed as "favorable" in DEIS Tables 4-4 and 4-17. If dam passage and harvest mortality rates cannot be sufficiently managed to meet the OER, then the ratings should be "marginal" or "unfavorable."

JR-86 cont'd

On a related point, in the analysis of allowable harvest the DEIS assumes that one stock/recruitment curve applies to the Elwha River, regardless of whether the dams are in place or are removed. As discussed in detail in NRC's Report, Appendix 2, it is more appropriate to develop separate stock/recruitment information for the dam removal versus dam retention scenario, and to distinguish between lower river, middle river, and upper river stocks. When undertaking quantitative fish production analyses, this level of detail is appropriate; Appendix 2 provides the technical results of the correct analysis. However, for the purposes of qualitatively evaluating the overall feasibility of restoration, the simplified approach used in the DEIS may be adequate. To make these comments as straightforward as possible, James River will follow the simplified conventions applied in the DEIS.

Beginning on page 4-17, the DEIS describes the method by which the individual factor ratings were combined into an overall assessment of restoration potential ranging from poor to excellent. Table 4-6 of the DEIS summarizes the approach. This table is reproduced below:

Restoration Outlook	Definition
Excellent	All four factors (passage, allowable harvest, habitat, and stock availability) are favorable.
Good	Two of four factors favorable; remaining factors at least marginally favorable.
Fair	All factors at least marginally favorable.
Poor	One or more factors unfavorable.

JR-86: cont'd The staff has used a "weak link" approach for "unfavorable" ratings. Factors with "unfavorable" ratings cannot be changed by increased ratings in other factors. For all other ratings ("marginal" and "favorable"), the staff did not apply this "weak" link. This type of procedure of using a "lower limit" for each factor that limits an overall rating, while any combination of factors above this limit can result in an overall rating in excess of the lowest factor, is used in other rating systems. For example, many of the U.S. Fish and Wildlife habitat evaluation procedures (HEP) use this method for rating specific fish species habitat quality (e.g., Raleigh 1982; Edwards et al. 1983). The staff believes its rating system more appropriate considering the level of knowledge available for the system. Both dam retention and dam removal will burden the fishermen, but the effects will vary depending on many factors that are not readily predictable in a quantitative manner. NRC presented much useful information, but many future factors could vary widely and affect this interpretation.

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Table 4-6 implies that a marginal outlook for one factor can be offset by favorable outlooks for the remaining factors (i.e. the restoration outlook can be classified as "good" even if half of the evaluation factors are "marginal"). James River believes a "weak link" approach provides a better analysis because the outlook for restoration can only be as bright as the least favorable of the factors.

James River also believes there would be less ambiguity in the analysis if the same terminology was used both in the evaluation of the individual factors and in the determination of the overall outlook for restoration. The DEIS defines the overall restoration outlook as "Excellent" "Good", "Fair" and "Poor", but characterizes the individual factors as "Favorable", "Marginally Favorable", or "Unfavorable". This creates confusion. James River suggests "Favorable", "Marginal", and "Unfavorable" be used in all evaluations, with subcategories of "Marginally Favorable" and "Marginally Unfavorable" reserved for describing subtleties in the overall outlook for restoration.

Taking each of the above considerations in mind, James River recommends Table 4-6 be revised to read as follows:

JR-86 cont'd

Restoration Outlook	Definition
Favorable	All four factors (induced mortality, habitat, available stock, risks of implementation) rated as favorable.
Marginally Favorable	One factor marginal, remaining factors favorable.
Marginal	Two factors marginal, two factors favorable.
Marginally Unfavorable	Three factors marginal, one factor favorable.
Unfavorable	One or more factors unfavorable OR all four factors marginal.

Before moving onto a species specific evaluation using the suggestions made above, James River must comment on a statement made on page 4-15 of the DEIS. It states, "The staff has assumed that very stringent harvest regulations are possible during restoration, but after restoration is achieved, harvest should be within present or expected future limitations." As previously outlined, the DEIS indicates the "restoration period" will be ten or more years long.

The fact that "stringent" reductions in Puget Sound sport and commercial harvest will be required for a period of at least 10 years under any scenario deserves more attention than it receives in the DEIS. The Long-term (after 10 years) harvest management implications are similarly dismissed without analysis. The Revised DEIS should provide full discussions on the burdens restoration will place on current and future generations of fisherman. The detailed analysis prepared by NRC and Gary Morishima (Appendix 2) provides the information necessary to produce a new, fully adequate, DEIS.

In the following sections, James River provides comments on the species-specific analysis provided in the DEIS starting on page 4-17 and 4-97. Again, the discussions will encompass both the dam retention and the dam removal alternatives to facilitate comparisons.

a. Fall and Spring Chinook Salmon

James River's analysis indicates the potential to restore fall chinook with the dams in place is Marginally Favorable due to a marginal rating for habitat and favorable ratings for the remaining three factors.

For the dam removal scenario, a rating of Marginally Favorable also results due to a marginal rating for the Risks of Implementation and favorable ratings for the remaining parameters.

For spring chinook, restoration under the with dams alternative is judged Marginal due to marginal Induced Mortality considerations and marginal Stock Availability. Under the dam removal alternative the overall outlook is also judged marginal for spring chinook due to stock availability and the Risks of Implementation.

JR-87

i. Induced Mortality

Under the dam retention alternative, induced mortality is judged to be favorable because the sum total of expected dam passage losses and harvest is at or below the OER. In making this determination, James River made adjustments to two dam passage factors contained in the DEIS. A Lake Mills passage mortality of 21 percent (predation plus residualism) was assumed in the DEIS based on an average of results obtained during test juvenile outplants in 1987 and 1989, and adjusted for mortality assumed to result from James River's proposed spill regime (DEIS page B-2). This rate is clearly too high because it is inappropriate to average the test results from 1987 and 1989. The 1987 tests were completely non-representative of natural conditions because:

1) Juveniles were planted only into Lake Mills, not the upper watershed. Fish were forced to live and grow in the lake, not simply migrate through it.

2) At the time the 1987 tests were conducted, the late-summer outmigration pattern exhibited by the stock was not known and intense monitoring efforts were concentrated in the spring and early summer. Many late-summer migrants were probably missed.

3) A consistent spill regime was not provided to move migrants out of the reservoir. As noted by Wunderlich and Dilley (1988), spill was only provided on 26 occasions between July 6 and September 2. This covers the peak of the natural outmigration period. Many fish which would have exited had spill been provided were unable to do so. James River proposes to provide spill on a daily basis between April 15 and November 15.

JR-87: The staff believes the rating system more accurately describes the prognosis for restoration of each stock.

Item No. 1 — Fish planted into Lake Mills also had the advantage of being stocked almost adjacent to the exit, which would have given them an advantage in leaving the lake, so they would not have to traverse the whole lake. In addition, the lake environment is not necessarily a poorer rearing habitat compared to river habitat.

Item No. 2 — The 1987 migrants appeared to leave earlier than the 1989 migrants; relatively few probably left in late summer.

Item No. 3 — It is agreed that some restriction might have occurred because of lack of spill, but the staff does not believe this outweighs the advantage of stocks being placed near the outlet when planted.

Item No. 4 — The true level of rearing potential for small chinook in this reservoir is not known.

The staff believes the average of 2 years is a valid survival estimate for passage. Adjustments were made for improved Eicher screen survival. The staff has retained its assessment numbers with some changes.

Habitat — The inability to use the middle reach habitat for spawning, lack of spawning habitat under reservoirs, reduced rearing habitat quality, and other factors contribute to the marginal rating. The staff does not know that spring chinook would use the middle reach for spawning if substrate were suitable. In addition, absence of spawning habitat in the reservoir reduces habitat quality in the middle and lower river, which affects ratings. All stocks from upriver will make at least partial use of the middle and lower river during outmigration. This is especially true for underyearling chinook that move downstream more gradually than other stocks. This results in a marginal habitat rating.

Risk of Implementation — As stated, this section is not needed as a rating criteria. However, while mortality has been quantified, exact values will not be known until all are installed, so risk still exists with dam retention.

The staff has proposed a restoration plan (Appendix A, Part 3.3) to reduce the risk of dam removal. **The staff, however, agrees that native stocks, particularly low runs, could be negatively affected.** This does not preclude reintroduction of other suitable stocks.

JR-87 cont'd

4) A total of over 65,000 juvenile chinook were planted directly into Lake Mills. The actual rearing capacity of the Lake is closer to 8,000 chinook juveniles (James River 1990). This degree of overcrowding (on top of a resident fish population which can be assumed to be in equilibrium with available habitat) must reduce lake survival of juvenile chinook.

In contrast to the 1987 studies, the 1989 studies offered an excellent opportunity to examine the passage survival of naturally-reared fish migrating through Lake Mills. The 1989 fish were planted in small groups throughout the upper watershed. Natural stream rearing occurred for a period of at least several months. The late-summer outmigration period was known and effective monitoring, funded by James River, occurred throughout. After applying a natural mortality rate for the rearing period, the DEIS predicted 23 percent of the planted fish should have reached the top of Lake Mills. In fact, 28 percent of the plants were detected exiting Lake Mills. As concluded in the DEIS (page B-3):

> "Based on the above mortality rate by the time major migration began, only 23 percent of the juvenile chinook stocked would be predicted to have still been alive in the reservoir at the beginning of the migration period. Considering that an estimated 28 percent left the reservoir (most after June 30), additional reservoir-induced mortality would be near 0 percent (100 percent survival)."

James River does not contend that no mortality occurs in Lake Mills, but the DEIS's estimate of 21 percent (the largest single mortality source in the entire dam passage model) is clearly high. James River believes an estimate of 10 percent is more appropriate.

Adjustments are also necessary to the assumed passage rates at Elwha Dam. The DEIS assumes a 10 percent mortality rate for chinook at the Eicher screen, and states (page B-6) this rate was suggested by James River in 1988. This is correct, but the information is outdated and should be revised based on results from the 1990 Eicher evaluations and preliminary results of the 1991 evaluation (See Appendix 3 of this document). Based on the more recent information, James River believes a more appropriate mortality rate for chinook passing the Eicher screen is one percent (note: as in the DEIS, these rates apply for spring chinook also); even better information will be available from the 1991 tests for inclusion in the new DEIS.

Using these alternative factors, James River suggests revision of Table 4-7 of the DEIS (page 4-19) to read as follows:

JR-87 cont'd

Table 4-7, Revised. Passage mortality of fall & spring chinook, Applicant's proposal.

Lifestage/Region	Fall Chinook Mortality(%)	Spring Chinook Mortality(%)
Outmigration of Juveniles		
Lake Mills/Glines Canyon Dam	16[1]	16
Lake Aldwell/Elwha Dam	6[2]	6
Total Outmigration	21	21
Upstream Migrating Adults		
Lake Aldwell/Elwha Dam	7.5	10
Lake Mills/Glines Canyon Dam	7.5	10
Total Upstream Migration	14	19
Total	28[3]	36

1 Approximately 10 percent due to estimated Lake Mills passage mortality and 6 percent is due to spillway/turbine mortality.
2 Approximately 1 percent is due to estimated Eicher screen mortality and 5 percent to estimated Lake Aldwell passage mortality.
3 Note total mortality is not additive, but multiplicative.

Following the approach used in the DEIS to evaluate harvest rates, an overall determination of the Induced Mortality factor can now be generated. Using the harvest rate equations provided in the DEIS on page 4-18, James River calculates the total allowable harvest rate on a restored chinook stock to be 70 percent for fall chinook (1-[1-.78]/[1-.28]) and 36 percent for spring chinook (1-[1-.59]/[1-.36]).

Using the decision criteria provided in the DEIS (60 to 80 percent allowable harvest rates are achievable, 40 to 60 percent are marginally achievable), the overall Induced Mortality factor is judged to be Favorable for fall chinook and Marginal for spring chinook under the dam retention scenario. For the dam removal scenario, a Favorable rating applies to both stocks.

ii. Habitat

James River generally agrees with the habitat assessment provided in the DEIS for chinook. However, an inconsistency in the exact approach used in the DEIS is evident. On page 4-19 the DEIS concludes that the with dams Habitat rating should be reduced to marginal due to problems in middle and lower river. However, on page 4-18 it was assumed "most of adult fish

would ascend to the upper river to spawn" (resulting, in the DEIS, in the maximum dam passage mortality rates being applied to the stock). If the DEIS assumes fish will spawn predominantly in the upper river, Habitat conditions should be rated as Favorable, not Marginal. However, James River believes that significant numbers of fall chinook will spawn in the middle and lower river with restoration, and that project-affected habitat conditions will not be as favorable as conditions would be starting 10 to 20 years after dam removal. Therefore, James River rates habitat conditions for fall chinook as Marginal with the dams in place and Favorable with dam removal after the initial 10 year period. For spring chinook, James River believes that most spawning and rearing would occur in the upper watershed under either scenario and therefore, Habitat is rated as Favorable for this stock under both scenarios.

JR-87 cont'd

iii. Stock Availability

For the reasons outlined in the DEIS, James River rates stock availability as Favorable for fall chinook under both the dam removal and retention alternatives. Similarly, it is agreed spring chinook stock availability is Marginal under both scenarios.

iv. Risk of Implementation

For the with dams alternative, the Risk of Implementation of dam passage measures is Favorable for fall and spring chinook. As outlined in the DEIS, spill effectively passes juveniles at Glines Dam, the Eicher Screen has been demonstrated to exceed expectations at Elwha Dam, and both the ladder at Elwha Dam and the trap-and-haul at Glines are expected to be very efficient. This is not to say that these facilities will not cause mortality, but these factors have already been quantified under the Induced Mortality section.

For the dam removal alternative, the Risk of Implementation is judged Marginal for both fall and spring chinook due to the risk of losing both stocks (if, in fact, a spring stock exists). The fall chinook run is supported predominantly by the existing rearing channel, and this facility is not expected to be able to operate for a period of 7 years following dam removal (DEIS page 4-95). Given the concomitant in-river habitat degradation occurring at the same time, it is very possible this stock will be lost. Similar considerations apply to spring chinook, but the situation is even more serious given the very weak status of the potential stock.

JR-87 cont'd

v. *Overall Outlook for Restoration*

Based on the above analysis, James River suggests the portions of Tables 4-4 and 4-17 dealing with fall and spring chinook be revised to read as follows:

Note: The first line for each stock is for the With Dams Scenario; The second line is for the Without Dams Scenario.

Induced Mortality	Habitat	Available Stock	Risks of Implementation	Overall Restoration Outlook
Fall Chinook:				
Favorable	Marginal	Favorable	Favorable	Marginally Favorable
Favorable	Favorable	Favorable	Marginal	Marginally Favorable
Spring Chinook:				
Marginal	Favorable	Marginal	Favorable	Marginal
Favorable	Favorable	Marginal	Marginal	Marginal

b. **Coho Salmon**

The Restoration Outlook for coho under the dam retention alternative is judged Marginal due to marginal Induced Mortality factors and marginal Stock Availability. For the dam removal alternative, the restoration potential is also judged Marginal due to marginal Stock Availability and the Risks of Implementation.

i. *Induced Mortality*

JR-88

James River beleives that dam passage at the Elwha Project should be 1% based upon evaluations to date (see Appendix 3). For the dam retention alternative, the DEIS concludes that both Passage and Harvest considerations be judged marginal (page 4-22). James River agrees with the passage rates and the harvest considerations used in the DEIS. Therefore, Induced Mortality in James River's analysis is similarly judged Marginal. It is agreed that, given passage induced mortality levels, the total allowable harvest rate on coho will be 52 percent.

For the dam removal alternative, James River agrees with the DEIS that both Passage and Harvest be judged favorable (page 4-101), and that the total allowable harvest on coho will be 60 to 65 percent. However, it should be noted that the DEIS states that "rates of 40 to 60 percent would be only marginally possible" (page 4-22). According to these criteria, the necessary rate of 60 to 65 percent could, in fact, just as easily be judged as marginal.

ii. *Habitat*

James River agrees Habitat should be judged Favorable for coho under both the dam removal and dam retention scenarios.

JR-88: Induced Mortality — See responses to Department of Interior for Appendix B and response JR-87. The harvest criteria has been changed in Section 4.2.3. This does result in a "marginal" harvest rating.

Outlook for Restoration — The staff believes our current rating system more appropriately indicates the rating.

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iii. Stock Availability

James River agrees with the DEIS that Stock Availability should be rated as Marginal under both the dam retention and dam removal scenarios due to the lack of an existing, native, coho stock.

iv. Risks of Implementation

JR-88 cont'd

James River rates the Risks of Implementation as Favorable under the dam retention scenario. The success at Sunset Falls on the Skykomish River attests to the efficacy of providing fish passage to establish new coho runs. Under the dam removal alternative, Risks of Implementation is also judged as Favorable because, although the existing stock is maintained by the Tribal hatchery and may be lost, it is not a native Elwha stock. A new reintroduction program using Dungeness or other stocks should have about the same chance for successful restoration as the existing hatchery stock. Unfortunately, it may be that no stocks will be pre-adapted to the uniquely harsh conditions of the Elwha watershed.

v. Overall Outlook for Restoration

Based on the above analysis, James River suggests the portions of Tables 4-4 and 4-17 dealing with coho be revised to read as follows:

Note: The first line is for the With Dams Scenario; The second line is for the Without Dams Scenario.

Induced Mortality	Habitat	Available Stock	Risks of Implementation	Overall Restoration Outlook
Marginal Favorable	Favorable Favorable	Marginal Marginal	Favorable Favorable	Marginal Marginally Favorable

c. **Steelhead Trout**

Restoration potential for winter steelhead under both the dam retention and dam removal alternatives is judged Favorable due favorable ratings for all four factors. For summer steelhead the rate is reduced to Marginally Favorable for both scenarios due to uncertain Stock Availability.

JR-89

i. Induced Mortality

The DEIS rates both Passage and Allowable Harvest Rate as Marginal under the dam retention alternative, due predominantly to an assumed Eicher Screen mortality rate of 10 percent (the highest single mortality rate contained in the DEIS steelhead analysis). This was the

JR-89: See response JR-86.

Induced Mortality — Some Eicher screen test results have been included (see Appendix B). The staff believes the 43 percent harvest rate is correct.

Risk of Implementation — See response JR-87.

JR-89 cont'd

rate James River suggested in 1988, but this information is outdated and must be revised. As outlined on page B-11 of the DEIS, coho smolt mortality (as tested in 1990) was found to be only 2 percent, not the estimated 10 percent suggested by James River in 1988. Steelhead passage survival, owing to their strong swimming ability, should be even higher than the coho's 98 percent. Preliminary results from the Spring of 1991, suggests that 99 percent survival for steelhead smolts passing via the Eicher screen is appropriate (see FR-10). This applies to both summer and winter steelhead smolts, and therefore, Table 4-9 (page 4-25) of the DEIS should be revised to read as follows:

Table 4-9, Revised. Passage mortality of winter & summer steelhead, Applicant's proposal.

Lifestage/Region	Winter Steelhead Mortality(%)	Summer Steelhead Mortality(%)
Outmigration of Juveniles		
Lake Mills/Glines Canyon Dam	8[1]	8
Lake Aldwell/Elwha Dam	3[2]	3
Total Outmigration	11	11
Upstream Migrating Adults		
Lake Aldwell/Elwha Dam	7.5	10
Lake Mills/Glines Canyon Dam	7.5	10
Total Upstream Migration	14	19
Total	24[3]	28

1 Approximately 5 percent due to estimated Lake Mills passage mortality and 3 percent is due to spillway/turbine mortality.
2 Approximately 2 percent estimated Lake Aldwell passage mortality, with 1 percent Eicher screen mortality.
3 Note total mortality is not additive, but multiplicative.

Given the winter and summer steelhead passage mortality values of 24 and 28 percent, and an Optimal Exploitation Rate using the WDW Steelhead Methodology OER of 41 percent, the total allowable harvest rate under the dam retention scenario is 22 percent for winter steelhead (1-[1-.41]/[1-.24]) and 18 percent (1-[1-.41]/[1-.28]) for summer steelhead. Using the harvest evaluation criteria provided in the DEIS ("In the staff's judgement, harvest rates of 20 to 40 percent are reasonably possible under present and planned future management goals, while rates of 10 to 20 percent would only be marginally possible", page 4-26), the Induced Mortality

factor for winter steelhead under the dam retention scenario is judged Favorable, while a Marginal rating applies to summer steelhead.

For the dam removal alternative, James River agrees with the DEIS that both Passage and Harvest be judged Favorable (page 4-101), and therefore the Induced Mortality factor is similarly Favorable. Again, James River notes the OER for steelhead is approximately 41 percent, not the 43 percent cited in the DEIS.

ii. Habitat

James River agrees Habitat should be judged Favorable for both winter and summer steelhead under both the dam removal and dam retention scenarios. This is especially true given, as stated on page 4-26 of the DEIS, it can be assumed "most of adult fish would ascend to the upper river" to spawn.

JR-89 cont'd

iii. Stock Availability

James River agrees Stock Availability should be rated as Favorable under both the dam retention and dam removal scenarios for winter steelhead, and that the rating should drop to Marginal for summer steelhead due to the lack of an existing stock.

iv. Risks of Implementation

James River rates the Risks of Implementation as Favorable for winter and summer steelhead under the dam retention alternative. The strong swimming capabilities of steelhead lend themselves to passage via the proposed facilities.

For the dam removal scenarios, the Risks of Implementation for both winter and summer steelhead are rated as Favorable. James River does not discount the fact that the existing, self-sustaining winter run may be lost, but in contrast to the remaining restoration species, steelhead enjoy two advantages in terms of their restoration potential: 1) a fair number of artificial and wild steelhead stocks are available to try, and 2) as a species, steelhead are generally adapted to the harsh conditions they will experience in the Elwha River. Although not as preferred as the existing stocks, it is likely that given enough time, a non-native stock could be found which is adequately adapted to the Elwha River.

Regarding summer steelhead, the Risks of Implementation of the dam removal alternative is rated as Favorable because there apparently is not an existing stock to jeopardize.

v. Overall Outlook for Restoration

Based on the above analysis, James River suggests the portions of Tables 4-4 and 4-17 dealing with steelhead be revised to read as follows:

JR-89 cont'd

Note: The first line for each stock is for the With Dams Scenario; The second line is for the Without Dams Scenario.

Induced Mortality	Habitat	Available Stock	Risks of Implementation	Overall Restoration Outlook
Winter Steelhead:				
Favorable	Favorable	Favorable	Favorable	Favorable
Favorable	Favorable	Favorable	Favorable[1]	Favorable[1]
Summer Steelhead:				
Favorable	Favorable	Marginal	Favorable	Marginally Favorable
Favorable	Favorable	Marginal	Favorable	Marginally Favorable

1 Although the Risks of Implementation are rated as Favorable for the dam removal alternative, it is likely steelhead restoration under this scenario will be delayed while suitable alternative stocks are tested.

d. Pink Salmon

James River agrees with the DEIS that the restoration potential for pink salmon under the dam retention alternative is Unfavorable for the middle and upper river. However, restoring pink salmon to the lower river should be judged Marginal due favorable Induced Mortality factor and marginal ratings for the remaining factors.

JR-90 For the dam removal alternative, the restoration potential is judged Marginal due to marginal Stock Availability (page 4-103 of the DEIS), and a Marginal rating for the Risks of Implementation.

i. Induced Mortality

For the dam retention alternative, the DEIS concludes that both Passage and Harvest considerations be judged Unfavorable for pink salmon (page 4-28). James River is in agreement with the DEIS that passage conditions for pink salmon will be unfavorable in the middle and upper river due to the apparent inability of juveniles to migrate through lakes. This alone makes the Induced Mortality factor Unfavorable, even if harvest could be eliminated.

For the dam removal alternative, James River agrees with the text on page 4-102 of the DEIS that Allowable Harvest should be rated Marginal. It is noted there is a discrepancy between this text and the determination for Allowable Harvest made in Table 4-17 of the DEIS. The text (page 4-102) states, "Given the uncertainties in achievable harvest rates, the allowable harvest rate for pink salmon is rated marginally favorable." However, Table 4-17 rates

JR-90: The staff rating system evaluated all potential habitat areas. Because approximately two-thirds of the habitat will not be functionally usable because of the unfavorable passage survival, the unfavorable rating applies to this stock. The text has been changed to "marginal" for harvest. Refer to response JR-86.

Habitat — Refer to response JR-87. Even 1 year of harmful temperature could reduce this stock.

Stock Availability — The staff has proposed a restoration plan in Appendix A, Part 3.3 to improve restoration potential. The staff stands by its rating of "good."

Risk of Implementation — The NRC did not present any substantial reason in their analysis to provide a "poor" rating.

Overall Outlook for Restoration — Refer to response JR-86.

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Allowable Harvest as Favorable. In all other cases, when the term "marginally favorable" was used in the text, it was translated to "marginal" in Table 4-17. It is unclear why a different convention was used in this case.

Under normal circumstances, James River would conclude that the 60 percent Allowable Harvest rate indicated in the DEIS could be achieved, and would be in agreement with Table 4-17 (as opposed to the text) that this item should be rated as Favorable rather than Marginal for the dam removal alternative. However, the collapse in 1979 of the previously very strong Elwha pink salmon stock indicates that some unknown factor is continuing to depress pink salmon runs in the Elwha (and nearly all other major Puget Sound rivers). As discussed under the Habitat section below, the problem is not an existing conditions within the Elwha River. Therefore, it must be surmised that some condition is continuing to affect Elwha pink salmon stocks. Until this factor is identified and corrected, the Induced Mortality element of the analysis should be rated as Marginal.

ii. Habitat

JR-90 cont'd

James River disagrees that Habitat should be judged Unfavorable for pink salmon under the dam retention scenario and suggests a rating of Marginal instead. However, as correctly explained on pages 3-29 and 3-39 of the DEIS, the lower 4.0 miles of the Elwha River contain ample pink salmon spawning habitat which had been utilized by upwards of 40,000 pink salmon as recently as the mid-1960's (fifty years after construction of Elwha Dam). Runs were still strong up until 1979 when the Elwha stock (and most other Puget Sound stocks) collapsed. As concluded in the DEIS (page 3-29), "even after dam closure the Elwha was one of the Puget Sound region's largest pink salmon producer". Any potential habitat degradation resulting from the dams had certainly occurred prior to the collapse of the stock after 1979, indicating that an as yet unidentified factor is limiting current pink salmon production.

Note also strong pink runs maintained themselves even during the period when the lower river was subject to large scale fluctuations in flow due to the Glines Project sometimes being operated in a peaking mode in the 1950's and 1960's. It is inconsistent to predict that lower river temperatures will materially limit pink salmon production in the future (page 4-28) when the stock was very strong during periods when conditions were far worse than are currently the case under run-of-river operations.

It is recognized that the pink salmon spawning habitat quality of the middle river has been materially reduced by the presence of Glines Dam. For this reason, James River suggests a rating of Marginal be applied to the Habitat factor under the dam retention alternative.

For the dam removal alternative, James River agrees with the DEIS that Habitat be judged as Favorable (page 4-102).

JR-90 cont'd

iii. Stock Availability

James River agrees Stock Availability should be rated as Marginal under both the dam retention and dam removal scenarios due to the fact that no native pink salmon stocks are available. If not for the availability of a geographically nearby stock from the Dungeness River, Stock Availability for pink salmon would have to be rated as Unfavorable. As stated on page 4-103 of the DEIS when evaluating the dam removal alternative:

"Currently, there is no plan for pink salmon stock restoration if dams were removed. Because of the very low abundance of the native pink salmon stock (less than 50 fish) and high harvest rate, this process might take many years and even then might not be successful. Given these uncertainties, the availability of a stock for restoration is judged only marginally favorable."

James River believes it is inconsistent for the DEIS to outline these serious problems with pink salmon and yet rate the overall outlook for restoration with dam removal as Good (Table 4-17). The rating should be changed to Marginal.

iv. Risks of Implementation

James River rates the Risks of Implementation as Favorable under the dam retention scenario. While it is not expected that pink salmon fry will be able to migrate downstream through the lakes, construction of passage facilities should not endanger any existing pink stocks on the river.

Under the dam removal alternative, Risks of Implementation is judged as Marginal because the very weak existing stock is likely to be extirpated during the dam removal process. This would serve to compound the already critical stock availability problems previously outlined. If not for the availability of a geographically nearby stock from the Dungeness River, Risks of Implementation for pink salmon would have to be rated as Unfavorable. NRC has also assessed the prospect for pink restoration as poor (see Appendix 3).

JR-90 cont'd

v. Overall Outlook for Restoration

Based on the above analysis, James River suggests the portions of Tables 4-4 and 4-17 dealing with pink salmon be revised to read as follows:

Note: The first line is for the With Dams Scenario; The second line is for the Without Dams Scenario.

Induced Mortality	Habitat	Available Stock	Risks of Implementation	Overall Restoration Outlook
Unfavorable Marginal	Marginal Favorable	Marginal[1] Marginal[1]	Favorable Marginal[1]	Unfavorable Marginally Unfavorable[1]

[1] Note: if the Dungeness stock is not genetically adapted to the Elwha River and suitable for restoration, the Available Stock and Risk of Implementation ratings should be downgraded to Unfavorable. In this case, the restoration outlook would be rated Unfavorable for both scenarios.

e. Chum Salmon

James River predicts the outlook for restoration of chum salmon under the dam retention scenario is Unfavorable due to marginal ratings for Induced Mortality, Habitat, and Available Stock. For the dam removal scenario, the outlook is Marginal due to marginal ratings for Available Stock and Risks of Implementation.

i. Induced Mortality

JR-91

James River is in general agreement that chum salmon passage under the dam retention alternative would probably be poor. However, as noted in the DEIS (page 4-29), the very low ocean harvest rate for chum salmon can result in at least a Marginal rating for Allowable Harvest Rate. From this, James River concludes the Induced Mortality factor for chum under the dam retention alternative is Marginal.

For the dam removal alternative, the Induced Mortality factor is rated as favorable.

ii. Habitat

James River agrees with the DEIS that the Habitat factor for chum salmon should be rated as Marginal for the dam retention scenario and Favorable for the dam removal scenario.

iii. Available Stock

James River agrees with the DEIS that stock availability is a serious problem under both scenarios. As outlined by the DEIS for the dam removal scenario (page 4-103):

JR-91: Induced Mortality — Refer to response JR-86.

Available Stock — A restoration plan has been added (Appendix A, Part 3.3) to help restoration. Local stocks, although in low abundance, are present in the Strait of Juan de Fuca (about 12,000 total fish in the Strait run was predicted for 1990). A marginal rating for stock is appropriate. The staff believes the "good" rating appropriate.

Overall Outlook for Restoration — Refer to response JR-86.

"The stock selection and availability would be marginally favorable as for the applicant's proposal. Currently, there is no stock for restoration. Past efforts at increasing run size of chum in the Elwha system have not been successful, so relying on natural unassisted propagation may not work. Because of the very low abundance of Elwha River chum salmon and past enhancement failures, this process may take many years and may not be successful."

As with pink salmon, James River believes it is inconsistent for the DEIS to recognize this problem, but still rate the overall outlook of restoration for chum as Good under the dam removal alternative. The situation with chum is even more desperate in that there are no geographically nearby chum stocks which could be used. For these reasons, Available Stock must be rated as Unfavorable under both the dam retention and dam removal alternatives.

iv. Risk of Implementation

JR-91 cont'd

James River rates the Risks of Implementation as Favorable under both scenarios. Although the dam removal alternative will result in habitat degradation for 7 to 10 years, the complete absence of an existing native stock makes these considerations moot.

v. Overall Outlook for Restoration

Based on the above analysis, James River suggests the portions of Tables 4-4 and 4-17 dealing with chum salmon be revised to read as follows:

Note: The first line is for the With Dams Scenario; The second line is for the Without Dams Scenario.

Induced Mortality	Habitat	Available Stock	Risks of Implementation	Overall Restoration Outlook
Unfavorable Favorable	Marginal Favorable	Unfavorable[1] Unfavorable[1]	Favorable Favorable	Unfavorable Unfavorable[1]

[1] Note: if a suitably adapted chum salmon stock can be located, the Available Stock factor rating should be upgraded to Marginal for both alternatives. In this case, the overall restoration outlook for the dam removal alternative would improve to Marginally Favorable.

f. Sockeye Salmon

JR-92

James River is in agreement with the conclusion and reasons presented in the DEIS indicating that the outlook for sockeye is Unfavorable for all scenarios. In the absence of any evidence of historical sockeye runs in the Elwha River, the issue is more accurately labeled "introduction" than "restoration."

JR-92: Comment noted.

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g. Sea-run Cutthroat Trout

James River agrees with the DEIS that restoration of sea-run cutthroat is Unfavorable under the dam retention alternative due to Unfavorable Induced Mortality factors and Marginal Stock Availability. For the dam removal scenario, the restoration outlook is judged Marginally Favorable due to marginal Available Stock and all other factors being Favorable.

i. *Induced Mortality*

James River agrees the life history strategy of sea run cutthroat (repeated migrations into freshwater to feed and spawn, DEIS page 4-31) result in a Passage factor rating of Unfavorable under the dam retention alternative. This situation is unlikely to be offset by regulating harvest; the overall Induced Mortality rating for sea-run cutthroat is judged Unfavorable.

James River also agrees with the DEIS that, under the dam removal alternative, Passage considerations should be judged as Favorable and Allowable Harvest as Marginal, at worst. From this, James River suggests the Induced Mortality factor be rated as Favorable for the dam removal scenario.

JR-93

ii. *Habitat*

James River agrees Habitat ratings should be favorable for both the dam retention and dam removal alternatives.

iii. *Available Stock*

James River agrees Available Stock should be rated as Marginal for both scenarios due to the unlikely presence of an existing native anadromous stock. If not for the generally good availability of non-native artificial sea-run cutthroat stocks which could be tried on the Elwha (DEIS page 4-32), this factor would be rated as Unfavorable.

iv. *Risks of Implementation*

James River rates the Risks of Implementation as Favorable for both restoration scenarios because of the absence of an existing stock in the lower river.

JR-93: Available Stock — The staff disagrees with the stock rating. Sea-run cutthroat are not rare in the Northwest and a marginal stock is expected to be available.

JR-93 cont'd

v. Overall Outlook for Restoration

Based on the above analysis, James River suggests the portions of Tables 4-4 and 4-17 dealing with sea-run cutthroat be revised to read as follows:

Note: The first line is for the With Dams Scenario; The second line is for the Without Dams Scenario.

Induced Mortality	Habitat	Available Stock	Risks of Implementation	Overall Restoration Outlook
Unfavorable	Favorable	Marginal[1]	Favorable	Unfavorable
Favorable	Favorable	Marginal[1]	Favorable	Marginally Favorable[1]

1 Note: if a suitably adapted sea-run cutthroat stock cannot be located, the Available Stock factor rating should be downgraded to Unfavorable for both alternatives. In this case, the overall restoration outlook for the dam removal alternative would be Unfavorable.

h. Dolly Varden Char

James River agrees with the DEIS that restoration of Dolly Varden is Unfavorable under the dam retention alternative due to Unfavorable Induced Mortality factors and Marginal Stock Availability. For the dam removal scenario, the restoration outlook is also judged Unfavorable due to Unfavorable Available Stock.

i. Induced Mortality

JR-94

James River agrees the life history strategy of Dolly Varden results in a Passage factor rating of Unfavorable under the dam retention alternative. This situation is unlikely to be offset by regulating harvest; the overall Induced Mortality rating for Dolly Varden is judged Unfavorable.

James River also agrees with the DEIS that, under the dam removal alternative, Passage considerations should be judged as Favorable and Allowable Harvest as Marginal, at worst. From this, James River suggests the Induced Mortality factor be rated as Favorable for the dam removal scenario.

ii. Habitat

James River agrees Habitat ratings should be favorable for both the dam retention and dam removal alternatives.

JR-94: Available Stock — While no hatchery operations currently exist for these stocks in the state, anadromous stocks are not rare. The staff believes a stock could be obtained, possibly including the upper watershed. The rating should be "marginal."

Overall Outlook for Restoration — The main difference in the rating is the available stock, which the staff believes should be rated as marginal.

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iii. Available Stock

James River believes Available Stock should be rated as Unfavorable for both scenarios due to the unlikely presence of an existing native anadromous Dolly Varden stock and the lack of a hatchery stock closer than Alaska (DEIS page 4-32).

iv. Risks of Implementation

James River rates the Risks of Implementation as Favorable for both restoration scenarios because of the absence of an existing Dolly Varden stock in the lower river.

JR-94 cont'd

v. Overall Outlook for Restoration

Based on the above analysis, James River suggests the portions of Tables 4-4 and 4-17 dealing with Dolly Varden be revised to read as follows:

Note: The first line is for the With Dams Scenario; The second line is for the Without Dams Scenario.

Induced Mortality	Habitat	Available Stock	Risks of Implementation	Overall Restoration Outlook
Unfavorable Favorable	Favorable Favorable	Unfavorable[1] Unfavorable[1]	Favorable Favorable	Unfavorable Unfavorable[1]

[1] Note: if a suitably adapted Dolly Varden stock can be located, the Available Stock factor rating should be upgraded to Marginal for both alternatives. In this case, the overall restoration outlook for the dam removal alternative would improve to Marginally Favorable.

l. Resident Trout

JR-95 James River agrees resident trout resources are likely to be severely impacted by any restoration scenario.

JR-95: Comment noted.

j. Summary, Feasibility of Restoration

JR-96 Based on the analysis presented above, James River suggests Table 5-3 presented on page 5-6 of the DEIS be revised to read as follows:

Table 5-3, Revised. Anadromous fish restoration potential.

Species/Race	Applicant's Proposal	Removal of Both Dams
Fall Chinook	Marginally Favorable	Marginally Favorable
Spring Chinook	Marginal	Marginal
Coho	Marginal	Marginally Favorable
Winter Steelhead	Favorable	Favorable
Summer Steelhead	Marginally Favorable	Marginally Favorable
Pink	Unfavorable	Marginally Unfavorable
Chum	Unfavorable	Unfavorable
Sockeye	Unfavorable	Unfavorable
Sea-Run Cutthroat	Unfavorable	Marginally Favorable
Sea Run Dolly Varden	Unfavorable	Unfavorable

James River believes Table 5-3, as revised above, provides a much more realistic and pragmatic assessment of the restoration potential for both the dam removal and dam retention scenarios. One important note is that only minor adjustments to the methodologies and assumptions used in the DEIS resulted in fairly divergent predicted restoration outcomes. This simply demonstrates that, with the exception of the more well-understood species such as steelhead, chinook and coho, the true outlook for restoration under any scenario is best described as "Unknown". To imply otherwise is to raise expectations beyond those supportable by fact.

3. Results of Restoration

The comments provided in this section are based on fisheries information developed by Gary Morishima and Natural Resources Consultants (NRC); a complete description of the analyses undertaken by NRC can be found in Appendix 2, NRC (1991).

JR-97 James River contracted NRC and Dr. Morishima in response to several obvious shortcomings in the DEIS. Specifically, NRC was asked to provide a detailed analysis in three areas: 1) the adult production capacity of the Elwha River; 2) the short-term and long-term harvest management practices which would be necessary to achieve successful restoration; and 3) the economic benefits and costs of each restoration scenario.

JR-96: Comment noted. See earlier comments regarding stocks. In the staff's opinion, the "minor" adjustments made were actually major. For example, no weight was given to passage mortality directly, which is important for restoration independent of harvest. In addition, possible lack of local stocks of fish was overemphasized. These factors alone appear to be major errors in the assessment method proposed by the applicant.

JR-97: The staff has commented on the specifics of these factors in other locations.

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a. Adult Production Capacity of the Elwha River

After reviewing Tables 4-14 and 4-21 of the DEIS (the present and future adult production, harvest and escapement under the dam retention and dam removal scenarios, respectively), James River became concerned that analytical errors were made in the DEIS. The analyses undertaken by Gary Morishima and NRC confirm this conclusion. As described by NRC (Appendix 2 of this document) the DEIS:

> (1) contains mathematical errors, (2) incorrectly applies juvenile and adult dam and lake passage mortalities to salmon and steelhead runs, (3) misapplies population dynamics theory to given stock parameters, and (4) incorporates a number of inconsistencies. These shortcomings lead to an exaggerated and/or over-optimistic view of the magnitude of benefits that might be derived from the various options. Further, the DEIS overestimates dam and reservoir mortalities for chinook, coho, and steelhead for the dams-in scenario.

JR-98 In drawing these conclusions, NRC determined that the DEIS incorrectly calculated allowable harvest rates under the dam retention alternative (more harvest is possible with the dams in place than concluded in the DEIS) and overestimated total adult production under all scenarios (less fish are produced with restoration under any scenario). NRC revised DEIS Tables 4-14 and 4-21 to more accurately reflect the long-term results of the dam removal and dam retention scenarios. The revised tables, as calculated by NRC, are provided below:

Table 8a: Present and predicted total adult production, harvest, and escapement of fall chinook, coho, winter steelhead, chum salmon under the REMOVAL OF BOTH DAMS Alternative. Source: DEIS and NRC.

	Chinook		Coho		Winter Steelhead		Chum		Pink	
	Present	Future	Present	Future	Present	Future	Present	Future	Present	Future
Adult Production										
DEIS	13,500	34,000	22,000	39,500	4,000	5,721	<1000	36,000	<100	274,286
NRC		26,965		16,327		6,577		Not Studied		Not Studied
Harvest Rate										
DEIS	80%	78%	90%	65%	90%	43%	Unknown	50%	Unknown	65%
NRC	64%	78%	90%	65%		43%		Not Studied		Not Studied
Harvest										
DEIS	10,800	26,520	19,800	25,675	3,600	4,386	Unknown	18,000	Unknown	178,286
NRC		21,013		10,614		2,828		Not Studied		Not Studied
Escapement										
DEIS	3,500	7,480	2,200	13,825	400	5,184	Unknown	18,000	Unknown	96,000
NRC		5,952		5,713		3,749		Not Studied		Not Studied

Note: Pink and chum are not included because adequate data are not available to estimate production parameters.

JR-98: Summary of responses: (1) Some mathematical errors were made; (2) the staff did not misapply the dam passage mortality; (3) only in the strictest sense was the population dynamic misapplied, with little effect on conclusions in the document; and (4) the staff has not identified inconsistencies. The staff-developed mortality factors were appropriate.

See responses JR-228 to JR-233 for specifics on methods, potential production, application of dam mortality, use of maximum sustainable yield, and allowable harvest. The staff believes the numbers in the FEIS are more suitable than those presented in Tables 8a and 8b. The number of fish predicted in the future depends on several assumptions. The staff admits quite varied results can occur in estimating production depending on which assumptions are used. While the staff believes the number estimates are reasonable, the final numbers could vary substantially from those presented. As indicated in Section 1.4, Resource Objectives, restoration of anadromous stocks was an objective, while production of substantial numbers of harvested stocks was not so listed as a major resource objective. With this guideline, the number of fish produced was considered a secondary objective, carrying less weight than the main objectives.

Concerning comments on pink and chum (page 65), the staff believes the rating presented for these stocks is suitable. As stated earlier, the exact number and future productivity is more questionable in its predictability, but the number predicted was a secondary component in the EIS analysis, as was directed by the comments on the scoping document. Because of the possible range of potential fish production, heavy emphasis on the economic value of the fish is not warranted.

Table 8b: Present and predicted total adult production, harvest, and escapement of fall chinook, coho, winter steelhead, chum salmon under the DAM RETENTION SCENARIO. Source: DEIS and NRC.

	Chinook		Coho		Winter Steelhead		Chum		Pink	
	Present	Future	Present	Future	Present	Future	Present	Future	Present	Future
Adult Production										
DEIS	13,500	19,351	22,000	30,146	4,000	7,344	<1000	<1000	<100	<1000
NRC		14,098		13,845		4,513		Not Studied		Not Studied
Harvest Rate										
DEIS	80%	59%	90%	52%	90%	17%	Unknown	Unknown	Unknown	Unknown
NRC	64%	68%	90%	58%		32%		Not Studied		Not Studied
Harvest										
DEIS	10,800	11,487	19,800	15,678	3,600	1,231	Unknown	Unknown	Unknown	Unknown
NRC		9,578		8,030		1,444		Not Studied		Not Studied
Escapement										
DEIS	3,500	7,864	2,200	14,468	400	14,468	Unknown	Unknown	Unknown	Unknown
NRC		4,511		5,815		3,069		Not Studied		Not Studied

Note: Pink and chum are not included because adequate data are not available to estimate production parameters.

JR-98 cont'd

James River would like to add several comments regarding the information provided by NRC. First, all of NRC's estimates are based on the original production potential estimates generated by the JFWA in their FERC filing of August 16, 1988. Thus, the values contained in revised Tables 4-14 and 4-21 are the agencies' production estimates analyzed using correct population dynamics theory. As noted by James River on numerous occasions, the agencies' production potential estimates appear to be inflated. If so, the values contained in revised Tables 4-14 and 4-21 are also overestimates. It is important to note that, even when the most optimistic production potential estimates are used, restoration under any scenario leads to *less* fish being produced and harvested than under existing conditions.

A second comment of James River's is that, in the DEIS, the vast bulk of future fisheries production under the dam removal scenario is accounted for by pink and chum salmon. As previously outlined in these comments, James River's assessment of the restoration potential for these species is unfavorable under any scenario. In conducting its analysis, NRC reached the same conclusion, rating the potential for pink and chum restoration as "poor." Under these circumstances, it is inappropriate to include production potential estimates for these species when quantifying potential benefits. Simply stated, if there is less than a marginal chance that these species will be restored, they should not be included in Tables 4-14 and 4-21. As presented in revised Tables 4-14 and 4-21, the differences between the dam removal and dam retention scenarios, in terms of fisheries production and harvest of chinook, coho, and steelhead, are relatively minor. The tremendous benefits of dam removal, as outlined in the DEIS, simply do not exist.

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b. Harvest Management Considerations

With the exception of brief references to the need for harvest management restrictions in order to achieve restoration, the DEIS provides no information on this important topic. The reader is left with the impression that no hard choices will have to be made because there will be more fish than fisherman will know what to do with. As indicated in NRC's Tables 8a and 8b, the number of fish available for harvest is over estimated for any scenario. The situation is even further exacerbated when contribution to Region 6 and Tribal harvest is considered.

The harvest management decisions which will have to be made will be difficult under all scenarios. Little if any benefits will flow to local fishermen or the local economy under either dam retention or dam removal options. To provide an accurate assessment of the harvest management issue, NRC first analyzed the existing catch distribution of the Elwha River's chinook and coho stocks. The analysis was not completed for steelhead because they are not normally caught outside the terminal area and there is not enough information regarding the catch of the remaining species to draw any firm conclusions. Once the existing catch distribution is known, conclusions can be made regarding which fisheries can be managed most effectively to achieve restoration.

JR-99 In conducting its analysis, NRC examined both the short-term (12 years as estimated by NRC) and long-term harvest management actions required to support restoration. James River will not attempt to provide individually the details of both with and without dam analyses because it appears as if similar actions would be required under either time-frames. Particularly under the dam removal scenario, even the most aggressive harvest restrictions may not sustain the existing stocks without continued hatchery supplementation. Therefore, NRC concluded that the most significant action which could be taken in the short-term is to continue to provide hatchery supplementation so that there is not a total reliance on wild production during the initial 12 year restoration period. The summary of NRC's results provided below focuses on harvest management actions required from the outset of restoration and continuing in perpetuity. Each species will be treated separately.

i. Coho

Existing Elwha coho stocks are fished at an exploitation rate of approximately 90 percent. According to NRC, "it is clear that the existing fishing rate of coho...cannot be sustained under either the dams-in or dams-removed scenarios, and that considerable reductions in fishing will be necessary." Currently, the vast majority of Elwha coho are taken in various and numerous Canadian fisheries (51 percent of the total catch) and in the Elwha Tribe's terminal net fishery (29 percent of the total). No other single sport or commercial fishery accounts for more than five percent of the catch. Thus, if coho harvest is to be reduced from the existing 90 percent to the required rates of 65 percent (dams removed) or 58 percent (dams retained), the fisheries which would be logically targeted for restrictions would be either those in Canada or that of the Elwha Tribe. NRC concludes that getting the necessary restrictions in Canada (or

JR-99: The staff has presented more detail on time periods for restoration and where harvests may need to be reduced (Sections 4.1.8 and 4.2.8). The scenario presented by NRC is reasonable, but the exact future of important factors (such as future wild stock distribution, ocean or local harvest and management, and run size of other stocks) that influence harvest are currently unknown, will have major effects on harvest, and would greatly influence conclusions developed by NRC.

Coho — The staff has noted that terminal harvest would need to be greatly reduced or eliminated; however, future activity could change this. It is true that if current harvest rates are maintained, a wild stock would be difficult to maintain considering the rating for harvest for dam removal was lower. However, harvest rates can be changed through management action and international treaty. The staff does not know what the rates may be in the near term or particularly in the long term. As emphasized by Dr. Morishima, catch distribution tables (in your appendix) are appropriate "only when assuming that fishing patterns do not change." Fishing patterns of the future are not known. Also, information such as this can influence fishing patterns of the future.

While results are varied, it has been demonstrated that reduction in ocean harvest rates of stock can occur through international treaty goals, as demonstrated for some chinook (Pacific Salmon Commission, 1990). It has also been demonstrated that future patterns of ocean distribution of a wild coho stock may differ from that of the current hatchery stock. Other possibilities besides total elimination of tribal harvest are possible.

Chinook — The staff has modified the existing harvest rate to 64 percent as presented by NRC. Sections 4.1.8 and 4.2.8 present the potential harvest scenario. A more detailed discussion is not necessary. Currently, few chinook are taken incidentally, so loss of any harvest of this stock would be insignificant.

The staff does not know that no harvest of any species could occur for 12 years. Many stocks would likely be near optimum run size (MSY levels) by that time and some harvest could happen before MSY run levels were achieved, although such harvest would extend the time period for restoration.

mixed-stock U.S. fisheries) is very unlikely, and therefore "the only logical management action would be to eliminate the in-river [Elwha Tribal] fishery."

In short, management decisions could require the permanent elimination of the existing Elwha Tribal coho fishery (the major fishery available to the Tribe) in order to restore wild coho runs to the Elwha River. The DEIS does not contain this information, which is essential for the public, and particularly the tribal fishermen, to understand and provide meaningful comment on the impacts of dam removal.

ii. *Chinook*

JR-99 cont'd

The results of NRC's analysis indicate that, contrary to widely held opinion, the existing exploitation rate on Elwha chinook is a relatively low 64 percent (the DEIS incorrectly lists the existing exploitation rate as 80 percent). It is significant to note that the existing exploitation rate must be increased, under either scenario, to achieve the MSY rates of 78 percent (dams removed) or 68 percent (dams retained). Note that this increase in harvest would only occur after full restoration was achieved due to the need to protect existing stocks during the initial 12 year restoration period. During initial years chinook harvest rates would not be increased (in fact, should be further decreased if possible) for a period of approximately 12 years under either scenario.

As with coho, changes in harvest management would be most profound in the terminal area. During the initial 12 year restoration period, all harvest in the terminal area would be eliminated. The Elwha Tribe would face a 12 year elimination of even the modest chinook test fishery which has occurred in recent years. This would be especially true under the dam removal scenario because degradation of natural habitat and loss of the existing hatcheries would force very stringent measures in order to protect the existing chinook stock.

After a period of about 12 years, and assuming restoration was successful, chinook harvest rates could be managed to achieve the desired rates of 78% (dams removed) or 68% (dams retained). NRC indicates that the increased rates would most easily be achieved by increasing terminal harvest. Under the dam removal scenario, NRC estimates that the Tribe may be able to harvest significantly more chinook. James River recognizes that this represents a substantial benefit to the Tribe compared to existing chinook harvests which range near zero. However, this potential benefit must be put in context.

First, the chinook harvest can be realized only after a 12 years of no harvest on any species. This will certainly create economic hardship within the Tribal fishing community. Second, the present Tribal coho harvest (comprising the Tribes most important fishery) must be completely eliminated forever. Thus, restoration requires that the Tribe bet their existing coho harvest on the chance that chinook restoration will be successful, as quick, and of the magnitude indicated by the agencies' production potential estimates. If chinook restoration is not

successful, or if it does not meet agency expectations, the Tribe will lose its coho fishery without the benefit of a replacement chinook fishery.

JR-99 cont'd

James River believes that the types of trade-offs, risks, and potential benefits indicated by the NRC analysis must be included within a new draft DEIS. The existing DEIS is inadequate in describing the full fisheries and economic impacts which will result from each restoration scenario.

c. Economic Analysis

The Economic benefit for each of the several scenarios was estimated by NRC (see Appendix 2 of this document). In their analysis they used corrected production estimates, harvest was distributed among the various fisheries based on their analysis of coded wire tag data, and the value of each harvest segment was determined using standard procedures. They did not include values for pink and chum salmon because of their assessment that restoration potentials for these species are poor. They determined that the annual values for chinook, coho, and steelhead harvests would be (from NRC Table 18):

	Present	Dams In	Dams-Out
Total	$746,053	$507,561	$893,864

JR-100

In the NRC analysis, it was assumed that if the hatchery were retained during the in-river stock restoration period, fish would be available for harvest at MSY levels for the dams-in alternative during and following completion of installation of fish passage facilities. For the dams-removed options, the study assumed an average full production of MSY would occur after 12 years and no harvest of fish would occur before that time. Furthermore, the NRC study noted that unless an agreed-upon reduction in Canadian fishing for coho could be achieved, the State would have to curtail U.S. harvest of the Elwha coho stock significantly. In order to avoid closing most U.S. mixed stock fisheries, the authors assumed, for management and economic study purposes, that the in-river tribal fishery would have to be terminated. If not, then significant sectors of the U.S. North Puget Sound net and sport fisheries for coho, regardless of the river of origin, would need to be closed to protect the Elwha coho run, with greater economic losses.

NRC determined the net present value of harvested fish for present conditions, dam retention and dam removal for chinook, coho and steelhead. Over a fifty period of analysis, they calculated net present values to be (from NRC Table 19):

	Present	Dams In	Dams-Out
Total	$19,166,899	$13,041,234	$14,098,197

The net present value of the existing harvest is greater than either of the alternatives. While the dam removal alternative has a greater annual benefit, that benefit is not realized until restoration has been achieved and terminal harvest of chinook and steelhead has been restored. The consequence of the moratorium on terminal harvest significantly reduces the Net Present Value for the dam retention and dam removal alternatives.

JR-100: The staff has adjusted the economic benefit values. The staff has retained pink and chum salmon because of good potential for restoration.

The staff has included a reduced harvest period of 8 to 20 years depending on stock in the analysis.

Again, the staff does not know the future of harvest management but agrees that most terminal harvest of coho would be greatly reduced or eliminated.

See Sections 4.1.8 and 4.2.8.

The distribution of harvest is of interest but is secondary for the overall assessment. Also, the future harvest distribution is dependent on many factors and could change significantly.

The economic benefits calculated by NRC include all fisheries intercepting Elwha stocks. The calculated benefit includes fisheries in Alaska, Canada, Oregon and Washington. NRC's Tables 11 through 16 report the harvest distribution for chinook and coho for the present condtiton, dam retention and dam removal. These tables indicate that a substantial proportion of the harvest occurs in Alaska and Canada under current or future scenarios.

	Alaska (%)	Canada (%)	Total (%)
Chinook	13	44	58
Coho	0	44	45

JR-100 cont'd

Table H-1 provides the Gross Annual Value of chinook, coho and steelhead from North Puget Sound Net, Sport and Indian Terminal fisheries. Table H-1 shows that only a portion of the economic benefits listed in NRC's Tables 18 & 19 would be felt in Port Angeles area and the terminal fishery.

NRC observed in their report that the contribution of Elwha fish to the North Puget Sound (or Juan De Fuca) mixed stock fishery was minor. Effects on the local non-Indian commercial fishery would be modest and probably not result in any changes in the pattern of current practices. Similarly, it is unlikely that there would be any changes in saltwater sport fishing.

Assuming a management decision were made to terminate the in-river coho fishery for the dams-in and dams-removed proposals, the major losses and gains would occur in the terminal tribal fisheries. As noted above, under this assumed management decision Elwha tribal fisheries would lose their in-river coho fishery, while after the restoration period increases in chinook would largely flow to the tribal fisheries. Sports harvest of coho and steelhead would decline under either scenario, while the Elwha sport chinook catch would increase.

4. FERC Recommended Mitigation

JR-101

In Section 4.1.3.3 of the DEIS, FERC staff considers a number of additional fisheries mitigation measures beyond those in the Applicant's proposal. In general, James River believes FERC staff performed the appropriate type of analysis of such potential measures, comparing the incremental cost and the incremental fisheries benefits of each measure to determine whether it should be added. FERC correctly recognized that any incremental fisheries benefit that might result from adding fish screens or switching from a trap-and-haul to a ladder at Glines Canyon would be far outweighed by the cost of the measures.

JR-102

However, James River questions two of the additional measures which FERC staff recommends. First, in light of the extraordinarily positive results of the Eicher screen tests, including recent chinook passage tests, it does not appear necessary or reasonable to prepare a detailed contingency plan for conventional screens. Second, it is doubtful that the design

JR-101: Comment noted.

JR-102: The staff believes that a contingency plan still needs to be retained for the Elwha screens, because differences may still occur at the different turbine intakes for this new technology.

Because of the risk of problems with passage, particularly for a retrofit of a ladder, the staff believes the recommended changes are appropriate. Because nearly all fish in the system will pass above the ladder, small differences in successful fish passage here can have substantial effects on system production of salmon and trout.

Additional costs have been included.

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changes for the Elwha fish ladder will result in any incremental fisheries benefits. Therefore the design changes, with their cost of $1.3 million, should not be required.

While James River believes that further analysis will indicate that some measures may not be required, nevertheless, the cost of FERC recommended measures should be included in Table A-23 to provide a conservative cost estimate of this alternative.

Table H-1. Gross Annual Value of Chinook, Coho and Steelhead From North Puget Sound Net, Sport and Indian Terminal Fisheries.

Species		PRESENT Number	PRESENT Weight (lbs)	PRESENT Value ($)	DAMS IN Number	DAMS IN Weight (lbs)	DAMS IN Value ($)	DAMS OUT Number	DAMS OUT Weight (lbs)	DAMS OUT Value ($)
CHINOOK										
Commercial Net		635.3	10,594	$16,314.80	573.2	9,559	$14,720.00	1,096.3	10,283	$28,155.80
Sport		1,235.6	26,098	$55,602.00	1,114.9	23,547	$50,171.00	2,132.4	45,039	$95,958.00
Terminal Indian	(1)	11.3	254	$391.00	552.0	12,424	$19,133.00	3,630.0	81,604	$125,670.00
Subtotal		1,882.2	36,946	$72,307.80	2,240.1	45,530	$84,024.00	6,858.7	144,926	$249,783.80
COHO										
Commercial Net	(2)	899.0	7,660	$11,567.00	566.0	5,685	$8,584.00	667.0	4,821	$7,280.00
Sport	(3)	5,605.0	43,599	$64,858.00	102.0	619	$24,760.00	120.0	728	$29,120.00
Terminal Indian	(4)	162.0	983	$39,320.00	0.0	0	$0.00	0.0	0	$0.00
Subtotal		6,666.0	52,242	$115,745.00	668.0	6,304	$33,344.00	787.0	5,549	$36,400.00
STEELHEAD										
Sport	(1)	1,800.0	12,600	$13,482.00	722.0	#NA	$5,408.00	1,414.0	#NA	$10,591.00
Terminal Indian	(1)	1,800.0	#NA	$225,000.00	722.0	#NA	$90,250.00	1,414.0	#NA	$178,500.00
Subtotal		3,600.0	#NA	$238,482.00	1,444.0	#NA	$95,658.00	2,828.0	#NA	$189,091.00
GRAND TOTAL		12,148.2	89,188	$426,534.80	4,352.1	51,834	$213,026.00	10,473.7	150,475	$475,274.80

(1) Future Terminal Harvest, Available After Decommissianing and Restoration
(2) U.S. Juan De Fuca Net
(3) Region 6 Harvest
(4) Future Terminal Harvest Eliminated

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5. Fisheries Resources Comments

COMMENT FR-1 Historical Numbers of Fish

Reference: Sec 3.4, page 3-28.

JR-103 The DEIS refers to "historical numbers" of fish. The Revised DEIS should state the historical numbers and identify its source of information. The DEIS summarizes production potential estimates generated by the resource agencies for several species. Production potential estimates are not valid indicators of the presence or population levels of species prior to dam construction. Photographs of the log jam at Elwha Canyon at the time of initial construction indicate that the river may not have been accessible at all times. The Revised DEIS is correct in observing there is no record of historical sockeye runs on the Elwha River.

COMMENT FR-2 Effect of Sediment on Aquatic Habitat

Reference: Sec 4.1.3.1, page 4-11.

JR-104 The DEIS assesses the effect of sediment upon aquatic habitat. The Revised DEIS should discuss the effect of construction related sediment events on aquatic habitat in the context of naturally occurring events. In this context, sediment contribution from construction of the Elwha fish ladder would be insignificant when compared to natural events.

COMMENT FR-3 Construction Related Sediment, Dam Retention Scenario

Reference: Sec 4.1.3.1, pages 4-11 through 4-12.

JR-105 The DEIS's discussion of the effects of increased sediment levels in the river during construction of fish passage facilities is inconsistent. In discussing each effect (i.e. fry survival, egg mortality, macroinvertebrate productivity), the DEIS first states that impacts to the resource could occur, and then goes on to say that they won't. For example, "The suspended sediment load from construction would temporarily increase the percentage of fine sediment in gravels below the construction sites, which could reduce salmonid egg and fry survival, and reduce benthic invertebrate abundance" followed by "Levels of suspended sediment are not expected to be high or persistent. The construction zones are small and situated in rocky areas, which will reduce fines input. The river substrate downstream of the two dams is generally very low in fines and thus would buffer sediment input to spawning beds of trout and salmon. Also, most major spawning areas below the dams are at least 1 to 2 miles downstream, so settled sediment

JR-103: The text has been changed in Section 3.4.1.1.

JR-104: The text has been changed in Section 4.1.3.1.

JR-105: The text has been revised in Section 4.1.3.1.

would be more concentrated near the construction activity above the major spawning areas." It would be more appropriate to state that suspended sediment load from construction would not be expected to have a noticeable effect on salmonid egg and fry survival.

JR-105 cont'd

On page 4-12, the DEIS states that the highest levels of sediment expected would be about 1,200 mg/l during high river flow. This number seems extremely high considering the extent and location of instream construction work, that work will be done during the low flow season, and the comments quoted above. Discussions with FERC staff at the April 4, 1991 public meeting indicated that this number was based on their experience during construction of the Koma Kulshan small hydro project. The creeks involved in that construction project (Rocky, Sandy, and Sulphur Creeks) carry extremely high loads of fine-grained sediments. The beds of the three creeks contain 12-16% fine sediment (less than 2 mm). In contrast, the instream construction sites on the Elwha River will be in bedrock canyon areas immediately below the two dams. This areas contain little, if any fine-grained sediments (less than 0.5% less than 2 mm). It does not seem reasonable to assume that suspended sediment levels resulting from construction of the proposed Elwha fish facilities would be nearly as high as those produced during construction of the Koma Kulshan Project.

COMMENT FR-4 Applicant's Proposed Mitigation

Reference: Sec 4.1.3.2, page 4-12, 2nd para, "The basic approach..."

JR-106

The Revised DEIS should note that the applicant proposed a combined approach which proposed restoration of wild spawning/rearing fish as well as continued hatchery production of fish at the LET Hatchery and WDF Rearing channel. James River envisioned a scenario by which wild self-sustaining runs of coho, chinook, and steelhead were restored above the dams with hatchery harvest of other stocks. The DEIS does not contain an accurate summary of James Rivers proposals in these regards.

COMMENT FR-5 Hatchery Production

Reference: Sec 4.1.3.2, page 4-15, 1st para, "The stuff has..."

JR-107

The DEIS assumes that hatchery production would be discontinued. Many rivers in western Washington contain both hatchery and wild propagated fish. The Revised DEIS should assess the potential and the benefits of continuing operation of existing facilities perhaps using alternate species or stocks.

JR-106: While it is true that hatchery and wild stocks coexist in many systems in the Northwest, the objective for the Elwha River, in the staff's view based on comments received during scoping meetings, is to produce self-sustained runs of wild fish. It is not clear that hatchery production can coexist with wild natural runs in this system. Therefore, the criterion used for comparison of the alternatives was the production of wild stocks. The number of fish produced at hatcheries does not benefit the production of wild stocks.

JR-107: Criteria for why the staff did not include hatcheries in the analysis have been stated (see response JR-106 and Section 4.1.3.2). The major runs of hatchery fish (fall chinook and coho) are not likely to have different timing than future wild stocks. Additionally, hatchery stocks of steelhead, as well as other stocks, have the potential to adversely affect wild stock genetics. The staff, therefore, sees no way at this time to ensure different timing of wild stocks and no adverse effects on genetics with hatchery production. The staff believes the criterion used is valid as presented and will not include hatcheries in the analysis.

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COMMENT FR-6 Combining Restoration Factors

Reference: Table 4-4, page 4-14 and Table 4-17, page 4-98.

JR-108 In Table 4-4 and 4-17 the DEIS identifies several species with marginal restoration potential for at least one factor and still come to the conclusion that over all restoration potential is good. The usual practice when combining several factors (for example the NW PPC's evaluation of site ranking) is to assume that the minimum or limiting value takes precedence. (See discussion on page 37.) The Revised DEIS should revise its analysis and assess restoration potential based upon the weakest factor.

COMMENT FR-7 Management for Maximum Sustained Yield

Reference: Sec 4.1.3.2, page 4-16, 2nd para, "The allowable harvest...."

JR-109 The DEIS assumes MSY management for salmon and steelhead species. Under MSY similar number of returning adults would reach the spawning grounds for both the dam retentions and the dam removal alternatives. The Revised DEIS must correctly reflect MSY management. In terms of ecosystem benefits, restoration of coho, chinook and steelhead provides equal benefits under all scenarios. Given that restoration of the remaining species is doubtful under any scenario, it is incorrect to describe greater ecosystem benefits to the dam removal scenario.

COMMENT FR-8 Adjusted Fishing Harvest

Reference: Sec 4.1.3.2, page 4-17, 1st para, "The overall potential..."

JR-110 The DEIS uses the term "adjusted fishing harvest." The Revised DEIS should more clearly explain the likely short and long term harvest restrictions that are implied by this veiled reference to harvest allocation. See Appendix 2 for an analysis of harvest allocation.

COMMENT FR-9 Residualization

Reference: Sec 4.1.3.2, page 4-17, 3rd para, "For fall chinook..."

JR-111 The DEIS assigns an unreasonably high value for loses due to residualization. As described in Appendix B of the DEIS, the Applicant's and FAO's studies of juvenile chinook plants in 1989-1990 did not indicate any significant level of residualism in Lake Mills. The Revised DEIS should be revised to incorporate low levels of residualization. See discussion on page 42 of this copy.

JR-108: The method you propose is just one method of using an evaluation criterion and is not the best for this situation in the staff's opinion. The staff has already included a limiting factor in the rating system. That is, if one of the four criteria is rated as "unfavorable," the overall rating can be no better than "poor" with this method used. For combination of factors with "marginal" or "favorable" ratings, overall restoration potential rating will vary, not being restricted to just the lowest value. This type of method is commonly used in U.S. Fish and Wildlife Service Habitat Evaluation Procedures (HEP). An example of this type of method was used for brook trout (Raleigh, 1982) using a method described as an "equal component value method." Several other models for fish habitat quality use a variation of this method, where if any one of several rating factors is below some designated limit, then no compensation is possible with other factors. But if all factors are above a "lower limit," then the total rating is weighted by a combination of these factors that will result in the overall rating being higher than the lowest factor (Edwards, et al. 1983; Stuber et al., 1982; Edwards et al., 1982; Trial et al., 1983).

The staff believes that setting the lowest limit factor at "unfavorable" is most appropriate for the level of knowledge available and will leave the rating system as proposed.

JR-109: This requires no text changes in this section. However, the inclusion of the other stocks with dam removal is still considered good and will be retained.

JR-110: This section describes the methods used, not the implication of the effects. No further discussion is required here. Adjusted fishing harvest referred to here is the allowable harvest rate, after dam passage mortality is subtracted, that can be maintained to produce an approximate maximum sustainable yield.

JR-111: See response to James River comments in Appendix B.

COMMENT FR-10 Eicher Screen Passage Rates

Reference: Sect 4.1.3.2

JR-112 The DEIS uses out of date passage rates. The Revised DEIS should be corrected to use the passage rates determined during the spring 1991 evaluations appropriate passage rates were determined to be: chinook presmolts 98, chinook smolts 99, coho smolts 99, steelhead smolts 99. (See Appendix 3 of this document.)

COMMENT FR-11 Harvest Rates and Allocations

Reference: Sec 4.1.3.2, page 4-18, last para, "In the staff's..."

JR-113 The DEIS alludes to harvest regulations without discussing the substance of the problem. For many reviewers the assessment of benefits or liabilities of the alternative will depend upon the allocation of harvest opportunities. The Revised DEIS should discuss how harvest quotas will be allocated to the several fisheries, changes from current harvest rates for each species experience, and the prospects for achieving the proposed harvest rates. The Applicant's consultant, NRC has addressed harvest management and allocations in Appendix 2 of this document.

COMMENT FR-12 Chinook Juvenile Survival Rates

Reference: Sec 4.1.3.2, Table 4-7, page 4-19.

JR-114 The DEIS uses values for survival during reservoir transit that are too low. See discussion on page 42 of this document. The 28% over-summer survival rates for chinook juveniles which were observed during the experimental release in 1989 are very close to the survival rates observed in coastal Oregon rivers without dams and reservoirs. The Revised DEIS should use comparable rates.

COMMENT FR-13 Middle River "Seeded"

JR-115 Reference: Sec 4.1.3.2, page 4-20.

If species such as chinook are rearing limited then the Revised DEIS should assume the "seeding" of the middle river reach by juveniles from the upper river.

JR-112: Some changes made to passage values; see Appendix B.

JR-113: The question posed here is a socioeconomic question and is not one concerning restoration potential. See comments to NRC document.

JR-114: The staff believes the overall assessment is valid as presented. See responses to comments about Appendix B.

JR-115: There is probably adequate spawning only in the upper reach to produce the number of chinook needed to adequately seed the upper and middle reach rearing habitat. However, fish initially produced from spawning in the upper reach will probably suffer significant mortality from competition, predation, and passage in the upper reach before reaching the middle reach. It is probable that significant mortality from these factors will always result in less than full use of the middle reach rearing habitat.

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COMMENT FR-14 Harvest Allocation

Reference: Sec 4.1.3.2, page 4-22.

JR-116 The DEIS mentions "allowable harvest" but does not provide sufficient information for the reader to understand harvest management issues. The allocation of harvest between the several fisheries and regions will have major implications in the perception of benefits for either option. The Revised DEIS should discuss harvest allocation in order to permit informed discussion of this critical aspect of the several alternatives. (See Appendix 2 of this document.)

COMMENT FR-15 Restoration Plan

Reference: Sec 4.1.3.3, page 4-37, 1st para, "...time delays, construction impacts..."

JR-117 The Applicant concurs with the necessity of preparing a restoration plan including schedules, details of facilities, stocks used in the various programs, location of facilities, number, sizes, and ages of fish to be stocked. The Applicant continues to request the same level of information on the proposal for restoration following dam removal. FERC staff now makes the same recommendation (Section 4.2.3.3 on page 4-105). Informed discussion and decisions can not be made in the absence of a realistic description of the effort and the short and long term effects of restoration. The Revised DEIS must include a detailed restoration plan and an evaluation of the plan.

COMMENT FR-16 Cost of Fisheries Mitigation

Reference: Sec 4.1.3.3, page 4-34.

JR-118 The DEIS does not provide a description of, nor costs for, a restoration plan for the Dam Removal Alternative. The DEIS does not present a consistent comparison of mitigation costs in the text or in Tables A-23 and A-24. Table A-24 should be revised to include all costs for measures discussed in text plus the costs of the interim and long term mitigation/restoration plan proposed for Dam Removal. Section M, Costs, Table M-4 provides a revised Table A-24.

COMMENT FR-17 Impact of Sediment

Reference: Sec 4.1.3.4, page 4-38.

JR-119 Based on reasons given by the DEIS on pages 4-11 and 4-12, there is no reason to assume that increased sediment input under dam retention would have adverse effects on fish spawning and rearing habitat. The Revised DEIS should be corrected to remove this inconsistency.

JR-116: Again, the allocation of harvest is not the issue in the restoration potential of stocks. The question is if management can occur that will allow the stocks to succeed. The change in harvest by fishery in the near and distant future cannot be reasonably predicted in detail at this time. For example, the international treaty groups will decide on harvest of coho again in 1992, which could have major effects on what future harvest scenarios will be.

JR-117: A restoration plan for the dam removal alternative has been included in Appendix A, Part 3.3. It does not include harvest change scenarios as these require input from the management agencies and many poorly quantifiable assumptions about future distribution and harvest rates of stocks.

JR-118: Cost estimates are included for the dam removal scenario (see Appendix A, Part 3.3).

JR-119: The text has been changed in Section 4.1.3.4.

COMMENT FR-18 Restoration Potential, Pink and Chum

Reference: Sec 4.2.3, page 4-93, 1st para, "Over the long term..."

JR-120 On page 4-93 the DEIS states that there is "...a good potential for restoring all original salmon runs except sockeye,..." Chum and pink salmon restoration should be assessed as poor (see Appendix 1). The DEIS's pink and chum production numbers (Table 4-20, 4-21) should follow Tables 8a and 8b of Appendix 1. The Revised DEIS should assess pink and chum restoration as marginally unfavorable (see discussion page 50) and should discount the likelihood for successful restoration.

COMMENT FR-19 Fisheries Restoration Plan

Reference: Sec 4.2.3.1, page 4-93, 2nd para, "Passage Effects"

JR-121 The DEIS does not provide a specific implementation plan for fisheries restoration under the dam removal scenario. The absence of such a plan precludes informed review of the DEIS. The Revised DEIS should provide a detailed schedule and plan for adult holding, egg take, rearing, and out planting release sites.

COMMENT FR-20 Egg Survival at High Sediment Loads

Reference: Sec 4.2.3.1, page 4-94, 2nd para, "High sediment concentrations..."

JR-122 The DEIS does not adequately assess the risk to existing stocks during decommissioning and for the several years of high turbidity and sediment load that would follow. The Revised DEIS should assess the effects of sediment on egg survival under high levels of sediment deposition and suspended sediment. Sediment levels would threaten the viability of cohorts of eggs, juveniles and holding adults. The Revised DEIS should identify measures that are necessary to provide for high confidence that existing runs would be maintained during dam removal and during the initial years of restoration. If native stocks are lost during the dam removal process, the potential for successful restoration cannot be rated as "good."

COMMENT FR-21 Acceptable Sediment Concentrations

Reference: Sec 4.2.3.1, page 4-94.

JR-123 The DEIS states that, "Sediment concentrations between 300 and 500 mg/l would be present only for a few days at a time. Both of these normally expected concentrations would be acceptable to fish if they were not persistent." In other sections, the DEIS states that concentrations of 300-500 mg/l are expected throughout the summer construction periods and

JR-120: The staff has retained the assessment of pink and chum. See comment to your referenced pages.

JR-121: A general plan is provided in Appendix A, Part 3.3.

JR-122: The text in Section 4.2.3.1 has been revised to include more discussion of sediment effects. Additional measures to help ensure retention of stocks during removal are included (see Appendix A, Part 3.3 and staff-recommended measures for dam removal, Section 4.2.2.3). However, even if some stocks are adversely affected during this period, in the staff's view, other regional stocks can be obtained that will maintain the rating.

JR-123: The text has been changed in Section 4.2.3.1. Also, while natural stocks are important for restoration, their lack will not reduce the overall rating because other regional stocks can be obtained. However, the proposed restoration plan and supplemental measures included greatly reduce this risk.

JR-123 cont'd during winter high flows, and that "200 to 1,000 mg/l suspended sediment concentrations could induce direct mortality of fish, if exposure were for weeks or months." Based on these statements, direct mortality of both resident and anadromous fish in the river would occur each year during the summer construction periods (April through October) and during winter high flows. The Revised DEIS should conclude that if this habitat degradation results in the loss of existing Elwha stocks, the prospects for restoration under the dam removal scenario would be marginal, at best.

COMMENT FR-22 WDF Egg Take

JR-124 Reference: Sec 4.2.3.1, page 4-95, 2nd para, "Rearing channel effects..."

What percent of the WDF egg take is accomplished at their fish trap?

COMMENT FR-23 Coho - Chinook Rearing Habitat

Reference: Sec 4.2.3.2, page 4-96, 2nd para, "The more active..."

JR-125 The DEIS describes as "excellent rearing habitat" portions of the river that would become shallow braided channels without overhanging cover or pools. See Discussion of Sweasey Dam Removal in Appendix 2 of this document. Following the removal of Sweasey Dam on the Mad River in 1909 the aquatic habitat degraded significantly. Conditions have not yet returned to pre-removal conditions. The Revised DEIS should address the loss of good rearing habitat in the middle and lower river during the initial 10 to 20 years following dam removal.

COMMENT FR-24 Sustaining Fish During Dam Removal

Reference: Sec 4.2.3.2, page 4-96, 3rd para, "Substrate composition would..."

JR-126 The DEIS does not address the substantial impacts to the middle and lower river that would occur with dam removal and that could lead to the loss of existing stocks in the absence of a plan to sustain existing stocks during this period. The Revised DEIS should explain how salmon populations would be sustained during the dam removal and near terms restoration period.

JR-124: The text has been added to Section 4.2.3.1.

JR-125: See responses to JR-226 and JR-227 referring to Sweasey Dam.

Generally, there are many significant differences between the Elwha and the Sweasey Dam examples (e.g., much lower flows in the summer, major in-river gravel operation, upstream perturbations, major drought conditions, and existing fish passage facilities). Also, initial effects from removal of Sweasey Dam were not well documented, so the initial effects are based on memory of a few individuals.

JR-126: Another well-documented Northwest river system, the South Fork Toutle, had rapid habitat recovery from a much larger sediment impact than is predicted for the Elwha River.

COMMENT FR-25 Expansion of Estuary

Reference: Sec 4.2.3.2, page 4-100, 1st para, "Expansion of the estuary..."

JR-127 The DEIS discusses the "expansion of the estuary." Both the east and west banks of the river at its mouth are constrained by levees. The Revised DEIS should describe the type of estuary that will form under these conditions. As described by James River in its May, 1988 filing, historic maps made prior to dam construction do not show an estuary at the mouth of the Elwha. If not present prior to dam construction, it does not seem reasonable to believe an estuary would develop following dam removal when both the east and west banks are protected by levees.

COMMENT FR-26 Fish Delayed in Lower River

JR-128 Reference: Sec 4.2.3.2, page 4-100, 3rd para, "The dam removal alternative..."

The DEIS suggests that fish will delay in the lower river if fish ladders are present. The Revised DEIS should assume that with effective fish ladders that there will be no delay in fish moving up river.

COMMENT FR-27 Inconsistent Assessment

Reference: Sec 4.2.3.4, page 4-105, 1st para, "An increase in..."

The DEIS is inconsistent when it characterizes the impact of dam removal as moderately
JR-129 adverse. There will be a high loss of resident trout and potentially high mortality of naturally spawning salmon and steelhead eggs and fry in the middle and lower reaches. This mortality could lead to the loss of existing stocks before restoration was initiated. The Revised DEIS should characterize the loss of resident trout and the potential loss of lower river anadromous stocks as severe, and discuss the implication of these impacts in terms of the potential for restoration following dam removal.

COMMENT FR-28 Period of Adverse Effects

Reference: Sec 4.2.3.4, page 4-106, 1st para, "...WDF chinook channel..."

JR-130 The DEIS is not consistent in its discussion of adverse effects and how long the period of adverse conditions would last. Is the seven years of affect from the start of dam removal or does it start at the completion of dam removal? The DEIS states various periods - 2 to 5 years, 5 to 10 years, 5- to 7 years as much as 20 years. The Revised DEIS should be consistent in its assessment of adverse conditions.

JR-127: See text changes to Section 4.2.3.2.

JR-128: The text has been changed in Section 4.2.3.2.

JR-129: The text has been changed in Section 4.2.3.4.

JR-130: The text has been changed in Section 4.2.3.4.

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COMMENT FR-29 Sustaining Fish During Dam Removal

Reference: Sec 4.2.3.4, page 4-106, 2nd para, "Anadromous fish restoration..."

JR-131 The DEIS does not explain how spawning anadromous populations would be sustained during the decommissioning period and 5 to 10 years thereafter if the Elwha Tribal Hatchery and the WDF channel are not functioning and adverse conditions are present in the lower river. The Revised DEIS should present a plan for sustaining stock through decommissioning to the start of restoration. Alternately, the Revised DEIS should acknowledge the loss of existing stocks and the potential for these losses to significantly reduce the potential for restoration under the dam removal scenario.

JR-131: The two hatcheries would not be totally dysfunctional during the period. Recommended measures will help ensure their use. A plan was presented for stock maintenance (Appendix A, Part 3.3).

I. TERRESTRIAL RESOURCES

1. Discussion

JR-132 The DEIS compares the Applicant's mitigation proposal with the dam removal alternative using the U.S. Fish and Wildlife Service's Habitat Evaluation Procedures (HEP). In fact, the DEIS compares the Applicant's HEP analysis for a fifty year period against a dam removal scenario in which the vegetation has reached a mature condition, some two to three hundred years in the future. The DEIS "HEP" analysis assumes that Elwha Project lands would develop as wildlife habitat in contrast to the land use section which assumes that project lands would revert to either timber rotation or rural development. The DEIS does not compare similar time periods nor does it document all components of a HEP analysis. FERC should prepare a HEP analysis using common periods of analysis and conforming to the steps outlined in FWS's Manual 1-ESM-1, 1980.

JR-133 The DEIS is inconsistent in its analysis of impacts upon spotted owls and bald eagles. While finding the impact of the Applicant's proposed trap-and-haul system at the Glines Canyon Project detrimental to the owls, the DEIS characterizes the construction impacts of dam removal as only temporary and does not address the impact of the increased traffic as identified in the recreation section. FERC should address the fact that there is no minimum level of disruption of spotted owls which can be found to be acceptable and should include an actual spotted owl survey.

The bald eagle analysis should be revised using corrected numbers of fish in its analysis of the alternatives. Under MSY management the optimum number of fish reaching the spawning grounds is determined. The fishery is then managed to achieve that number. Thus, under MSY management, similar numbers of chinook, coho and steelhead would return to the spawning grounds under either scenario. The return of pink and chum salmon should be recognized as problematical and to include their numbers in the analysis is not appropriate. A corrected analysis will show that similar numbers of fish carcasses are available under either scenario.

JR-132: The FERC used the FWS Habitat Evaluation Procedure conducted by the applicant to: (1) describe current wildlife habitat in the study area, in terms of HU's (see Section 3.5.2); and (2) evaluate the expected results of the applicant's improvement plan over the 50-year license period, in terms of AAHU's (see Section 4.1.4.2).

To evaluate the long-term effects of dam removal on wildlife, the staff used the results of the HEP conducted by the applicant to estimate the value of habitat in the study area without the projects. By comparing HU's in the study area with the projects to those without, estimates of the HU's originally provided by the reservoir areas were obtained. The staff used these pre-project HU's to evaluate the long-term effects of the dam removal alternative on wildlife, since it is expected that habitat quality in the restored reservoir areas would ultimately be similar to original conditions. Since the FERC would have no control over Elwha Project lands if the dams were removed, the analysis of long-term effects was confined to the habitat expected to ultimately develop in the reservoir areas only. Consequently, the HU's in Table 4-24 (formerly 4-19) represent the incremental change in habitat caused by restoration of the reservoir areas at some point after mature plant communities establish (see Section 4.2.4.2). Section 4.2.5.2 has been changed to reflect the assumption that land currently under Lake Aldwell would be acquired as part of the dam removal alternative and managed as wildlife habitat.

It was not the intent of the DEIS to compare the results of the applicant's improvement plan, which is confined to a 50-year period and presented in terms of AAHU's, to the long-term effects of dam removal, which are presented in HU's that represent a single point sometime in the future. The staff is well aware of the time component of the HEP. However, the staff understands that some misinterpretation of the DEIS is possible, because HU's were inadvertently converted to AAHU's during a global change to add apostrophes (see response DOI-213). This problem has been corrected in Sections 3.5.2, 4.2.4.2, 4.3.4.2, and 4.4.4.2.

Because the evaluation of the long-term effects of dam removal was based on the HEP conducted by the applicant, there were no additional components or steps to document in the DEIS. However, to have a comparable time frame for all alternatives, the staff decided to conduct a HEP on the short-term results of dam removal, using a 50-year period of analysis. Like the HEP conducted on the applicant's habitat improvement plan, the results of the HEP on the short-term effects of dam removal are projected and not based on any measurements. The methods and assumptions used in this HEP are documented in Appendix D of the FEIS. The results are included in Sections 4.2.4.2, 4.3.4.2, and 4.4.4.2.

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JR-133: Section 4.1.4.3 states that "construction of fish passage facilities at the Elwha and Glines Canyon projects would temporarily disturb spotted owls if they occur in the vicinity of the dams and powerhouses of each project." This statement is then qualified by noting that construction of trap-and-haul facilities at Glines Canyon "would probably not involve blasting and should not significantly disturb spotted owls." The staff fails to see how James River can interpret these statement to mean that the DEIS finds "the impact of the applicant's proposed trap-and-haul system at the Glines Canyon Project detrimental to the owls."

Section 4.2.4.3 states that "removal activities at the Elwha and Glines Canyon projects would temporarily disturb spotted owls if they occur in the vicinity of the reservoirs, dams, and powerhouses." Removal activities are assumed to include increased traffic, human disturbance, etc., as described in Section 4.2.5.1. In addition, this section states that "at Glines Canyon, blasting associated with dam removal and terrace construction may disturb spotted owls, particularly during nesting season."

Based on the wording of these two sections, the staff does not believe that the DEIS is inconsistent in its analysis of impacts on spotted owls. However, to ensure that impacts to spotted owls are minimized regardless of the alternative selected, the staff has modified Sections 4.1.4.3, 4.2.4.3, 4.3.4.3, and 4.4.4.3 to include a recommendation for spotted owl surveys prior to any dam removal or construction activities. If a nest is located near any major construction/removal activity, a plan would be developed, in conjunction with the agencies, to minimize disturbance.

The bald eagle analysis was conducted using the escapement estimates developed by the staff. The staff recognizes that escapement is essentially the same under all alternatives for chinook and coho salmon. The major difference between the applicant's proposal and removal of both dams is the higher probability of restoring pink and chum salmon runs. Since chum salmon provide the primary food for wintering bald eagles, restoration of this species would be expected to result in an increase in the number of bald eagles wintering along the Elwha.

2. Terrestrial Resources Comments

COMMENT TR-1 Elk Densities in ONP

JR-134

Reference: Sec 3.5.2.1, page 3-54, 1st para, "The Roosevelt elk..."

The DEIS states Elk densities of 30/sq mile on the Hoh, and 44/sq mile on the Queets. Are these winter peak densities or densities of year around residents?

COMMENT TR-2 HEP Analysis - 1

JR-135

Reference: Sec 3.5.2.2, page 3-56, 2nd para, "The study area..."

The DEIS performed an incomplete HEP analysis and did not define HEP scenarios. It appears that the dam removal and the Applicant's proposal were not analyzed in a parallel way. If FERC considers HEP to be the appropriate methodology, the Revised DEIS should provide a standard HEP analysis in which alternatives are analyzed for the same period of time. The Revised DEIS should specify assumptions, state cover type areas, HSI's, and time steps in a consistent manner for each alternative. (Table 3-13, bottom row should be titled "Total Non-Reservoir Area.)

COMMENT TR-3 Beaver Habitat

JR-136

Reference: Sec 4.1.4.2, page 4-44, 2nd para, "For each year..."

The DEIS comments that beaver habitat adjacent to Lake Aldwell is limited by fluctuations of the reservoir and not by forage. Inspection of the perimeter of the reservoir indicates substantial relic beaver activity. The current perimeter vegetation is not used by beavers. The reservoir has a nearly constant reservoir level. Paucity of forage plants adjacent to the reservoir is a factor limiting beavers as indicated by ample relic signs of beaver. The Revised DEIS should be corrected to reflect actual conditions.

COMMENT TR-4 Terrestrial Mitigation Costs

JR-137

Reference: Sec 4.1.4.2, page 4-50.

The DEIS includes a number of staff recommendations for which costs have not been determined. The Revised DEIS should determine the cost of these measures and include them in the discussion and in Tables A-23 and A-24. FERC lists terrestrial mitigation cost for dam

JR-134: The elk densities presented in Section 3.5.2.1 were in error and have been corrected.

JR-135: See response JR-132. Table 3-13 has been corrected, as suggested.

JR-136: The statement that water fluctuation limits beaver use of Lake Aldwell has been removed from Section 4.1.4.2. Although forage may be the factor currently limiting beaver use of Lake Aldwell, the applicant's plan to increase forage species does not appear to substantially improve the situation, as indicated by an increase of only 4 AAHU's.

JR-137: Costs for staff recommended measures have been included in Section 4.1.4.2 and in the tables in Appendix A. Since applicant-owned lands adjacent to Lake Aldwell would not be purchased as part of the dam removal alternative, costs of land and timber were not included.

JR-137 cont'd removal as $430,000. If land and forest acquisition were included this cost would become $14,070,000 (see Table M-4).

COMMENT TR-5 HEP Models

Reference: Sec 4.1.4.2, page 4-50, last para, "The analysis of..."

JR-138 WDW insisted that the Applicant use the WDW deer and elk models. Problems with the WDW wintering deer/elk models have been discussed with WDW on several occasions since 1988 and the model is being revised. The Applicant proposed using a study area substantially larger than the project area in order to assess habitat conditions for wildlife. WDW insisted that studies be limited to the Elwha Project lands, lands immediately around Lake Aldwell and the Krause Bottom. See agency correspondence and meeting notes already provided.

COMMENT TR-6 Restoration of Natural Conditions

Reference: Sec 4.1.4.4, page 4-54.

JR-139 The DEIS establishes restoration of natural conditions in ONP as one of the principal resource objectives. ECPA establishes an applicant's mitigation objectives as mitigating for continuing impacts. The Revised DEIS should explain what actions are needed to mitigate for continuing impacts. Restoration of natural conditions within ONP is not mandated either by relicensing regulations or by ONP's Plans (see Section J for a discussion of ONP plans).

COMMENT TR-7 Spotted Owls

Reference: Sec 4.2.4.3, page 4-121.

JR-140 The DEIS states that there will be no adverse impact on spotted owls due to dam removal. The DEIS also states that blasting associated with dam removal and heavy equipment associated with terrace construction may disturb spotted owls, particularly during the nesting season. The DEIS does not address removal of spotted owl habitat along the upper reservoir. The DEIS makes no recommendations for mitigation.

All federally-regulated activities which result in the removal of suitable spotted owl habitat or which may cause disturbance to nesting spotted owls require a survey for spotted owl activity centers and nest sites and an assessment of potential impacts on spotted owls and their habitat. There is no minimum amount of habitat which may be removed, unless survey results and associated calculations show that no incidental take will occur. There is no minimum amount of acceptable disturbance unless survey results show that no harm or harassment will

JR-138: The staff recognizes that the applicant was aware of the problems with the deer and elk models developed by the WDW and that there was insufficient time to revise the models, rerun the analysis, and meet the FERC deadlines. In addition, several agencies appear to have recognized the problems with limiting the analysis to the study area (see responses DOI-72 and SOW-164).

JR-139: With regard to the licensing of existing projects, the FERC staff assesses resource needs and objectives, on the one hand, and opportunities for resource improvement afforded by the projects, on the other. Giving equal consideration to developmental and nondevelopmental values, the FERC then determines what combination of project modifications would result in maximum social well being.

JR-140: No spotted owls were observed in the vicinity of Lake Mills during recent surveys conducted by the NPS. However, the two active nests identified during the surveys were located within 2.2 miles of the reservoir and river, and most of the forests adjacent to the reservoir are considered suitable habitat for spotted owl (see Section 3.5.3.1). Dam removal would not involve the destruction of any spotted owl habitat along Lake Mills.

Because several years may lapse between the release of the EIS and any dam removal activities, it is possible that spotted owl nesting could occur near Lake Mills in the interim. Consequently, the staff has modified Section 4.2.4.3 to include a recommendation to conduct spotted owl surveys prior to any removal or construction activities. If any nests are identified that could be affected by the noise associated with removal activities or construction, a plan would be developed, in conjunction with the agencies, to ensure that disturbances to spotted owls are avoided or minimized. Consultation with the FWS would occur at this time.

JR-140 cont'd occur. Until the results of appropriate surveys are provided, no conclusions may be drawn as to whether dam removal would have adverse impacts on spotted owls.

The Revised DEIS must report spotted owl survey information, assess impacts and propose appropriate mitigation. Correspondence with the U.S. Fish and Wildlife Service and their recommendations must be provided.

COMMENT TR-8 Bald Eagles, Foraging Opportunities

Reference: Tables 4-12, 4-14, 4-20 and 4-21.

JR-141 DEIS Tables 4-12, 4-14, 4-20 and 4-21 present incorrect numbers for the escapement of salmon and steelhead under the dam removal and dam retention scenarios and biomass of available under each scenario. The inclusion of pink and chum into these tables may not be justified in view of the tenuous prospects for restoration. Tables 8a and 8b found in Appendix 2 of this document, show that under MSY management, escapement is expected to be similar for both the Applicant's proposal and the dam removal alternative. The tables do not include pink and chum salmon because they judge prospects for restoration to be poor. The Revised DEIS must use corrected numbers and pounds of fish entering the watershed and ONP. This will show little difference between the two alternatives.

COMMENT TR-9 Bald Eagles, Restoration of Salmon

Reference: Pages 4-53 & 54 and 4-122 & 123

JR-142 The DEIS reaches different conclusions about the benefits to bald eagles of restoration of chinook, coho and steelhead runs under the dam retention and dam removal scenarios, based on the same facts. Paragraphs which describe the value of chinook and coho to wintering bald eagles begin with the same sentences under the analysis of each scenario, but conclude that there would be no benefits from chinook or coho with the dams in place (p. 4-53), while with the dams removed, chinook and coho would provide forage for wintering bald eagles (p. 4-122). With dams in place, steelhead "may" provide forage in the spring (p. 4-54), while with dams removed, steelhead "would" provide forage (p. 4-123).

On page 4-53 the DEIS concludes that wintering bald eagle populations could only be increased with restoration of a chum run. On page 4-103, it is stated that "Because of the very low abundance of Elwha River chum salmon and past enhancement failures, this process may take many years and may not be successful." However, on page 4-122 the DEIS states that "The probability is good that removal of both dams would restore runs of chum salmon." James River believes the prospects for chum restoration are poor, and it is not reasonable to assume benefits to bald eagles from chum restoration.

JR-141: See last paragraph of the response to JR-134.

JR-142: The staff assumes that chum salmon runs are required to attract significant numbers of wintering bald eagles to a river drainage. In these drainages, chinook salmon would be expected to provide food to eagles arriving to the Elwha early in the wintering season. Coho salmon carcasses would provide food if spawning occurred in areas accessible to bald eagles and may attract this species to the upper reaches and tributaries of the Elwha in years when chum runs are low (see Section 4.2.4.3). The dam removal alternative has a good chance of restoring chum salmon runs and is therefore expected to result in a significant increase in the number of bald eagles wintering along the Elwha.

The applicant's proposal would not restore chum salmon runs and is therefore not expected to attract significant numbers of bald eagles to the Elwha. If eagles are not attracted to the area, there would be no early arrivals to the wintering area to feed on chinook salmon carcasses that would be available under the applicant's plan. Section 4.1.4.3 has been changed to indicate that coho salmon may provide some food if spawning occurred in areas accessible to eagles; however, it is unlikely that coho salmon runs alone would result in a large increase in the number of eagles wintering along the Elwha.

Section 4.1.4.3 has been changed to indicate that steelhead would provide supplemental food during the spring to bald eagles nesting near the Elwha delta.

The staff disagrees that restoration potential for chum salmon under the dam removal alternative is poor. The text has been changed in Section 4.2.3.2.

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COMMENT TR-10 Bald Eagles, Perches, Nests, Roosts

Reference: Sec 4.2.4.3 page 4-123.

JR-143 The DEIS concludes that removal of both dams would have no adverse impacts on bald eagles. However, the DEIS analysis did not address the loss of perch trees, potential nest trees and roost trees along the river from Glines Canyon to the coast under the dam removal scenario. The DEIS states that streamside vegetation will be lost and will not become suitable for bald eagles for at least 100 years (page 4-123). Although removal of habitat for at least 100 years may indeed be considered "temporary," it must also be considered adverse. The Revised DEIS should address the short to mid term adverse impacts upon bald eagles that dam removal would cause. Furthermore, the Revised DEIS should identify whether this loss would constitute a "taking" under the Bald Eagle Act and necessary mitigation measures should be identified. The FWS's comments on the impact assessment and mitigation plan should be included.

COMMENT TR-11 Bald Eagles, Use of Middle River

Reference: Sec 4.2.4.3, page 4-122, 2nd para, "The probability is..."

JR-144 The DEIS states that "Because chum would spawn primarily along the middle reach of the Elwha, this stretch would become the most important area for bald eagles wintering along the river." On page 4-111, however, the DEIS had already predicted that "Removal of both dams would increase the erosive capability of the Elwha River below the current site of Glines Canyon due to reduced stability of the river channel. Potential effects on plant communities adjacent to the river, particularly in Sweets Bottom along the middle reach of the river, include reductions in area from erosion as well as changes in structure and composition due to flooding. Existing wetlands in Sweets Bottom, including 106 acres of palustrine forest and 22 acres of palustrine scrub-shrub, would likely be subject to siltation and/or inundation until river channel stabilization occurs." On page 4-120, the DEIS described "potential adverse effects on habitats adjacent to the river, particularly in Sweets Bottom, include a number of short-term changes.....(including) ....loss of snags and large trees due to undercutting of banks..." The Revised DEIS should consider the prospects for chum restoration as poor and discount their importance to bald eagles. Short to middle term impacts on middle river habitat changes upon bald eagles should be addressed.

COMMENT TR-12 Osprey, Construction Disturbance

Reference: Sec 4.2.4.2, page 4-113, 3rd para, "Removal activities would..."

JR-145 The DEIS addressed temporary disturbances associated with dam removal, and recommended that such activities be conducted so as to avoid disturbing ospreys and passerine species during the breeding season (April through August). The Revised DEIS should identify

JR-143: James River appears to have misinterpreted Section 4.2.4.3, which states that "despite the potential availability of salmon carcasses along the river through the restored reservoir areas, it may take over 100 years before these stretches are used by wintering bald eagles because of lack of perch trees close to the water." Since the reservoirs are not currently used by bald eagles (see Section 3.5.3.1), dam removal would not result in a loss of habitat for this species.

Section 4.2.4.3 has been changed to indicate that dam removal may result in the loss of a few large trees along the middle and lower reaches of the river caused by increased lateral channel erosion. However, large trees appear to be abundant in these areas so lack of perch or roost sites would not likely limit bald eagle use if food were available during the winter.

It is difficult for the staff to conceive of how the potential loss of potential nest, roost, and perch trees could possibly constitute a "taking" under the Endangered Species Act. According the Endangered Species Act, the term "take" means to harass, hurt, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such activity. DOI comments indicate that the FWS believes that dam removal would significantly benefit bald eagles (see DOI-215).

JR-144: The staff believes that there is a good chance that dam removal would result in the restoration of chum salmon runs (see response to JR-228 through JR-233) and this assumption is used in the bald eagle analysis.

The staff does not believe that dam removal would result in any adverse short- to mid-term effects on bald eagles. See response JR-143.

JR-145: The staff agrees that dam removal activities are likely to disturb ospreys and passerine birds. Since it is unlikely that dam removal activities can be scheduled to avoid the April through August breeding season, disturbance to these species has been identified as an unavoidable adverse impact in Section 4.2.4.2. Consequently, there are no proposed mitigation measures that would affect dam removal costs and plans.

JR-145 cont'd necessary measures to prevent disturbance of osprey during their breeding season. These measures may impact decommissioning plans and costs.

COMMENT TR-13 Bald Eagles, Human Disturbances

Reference: Sec 4.2.6.2, page 4-129, 1st para, "The removal of..."

JR-146 On page 4-129, the DEIS predicts that "The removal of both dams would result in a significant positive impact in both the quantity and quality of the recreational fishery. Both coho and chinook salmon would be available for harvest in marine and in river fisheries at much higher levels than present conditions allow....Both winter and summer steelhead fishing would be better in quality and quantity, and additional miles of river would be available for steelhead anglers in the middle and upper reaches..." This assessment, while based upon a faulty analysis of fish production, nevertheless would indicate substantial disturbance of eagles and other wildlife. Human activity which occurs on the water and at the water's edge has been shown in numerous studies of bald eagle behavior to be more disturbing to eagles than regular or continuous activity, such as vehicle traffic on a road, particularly if vegetative screening exists. Although numerous bald eagle references are cited in the DEIS, the impact of human activity is not mentioned. Disturbances cause avoidance flights, which in turn restrict habitat use, reduce foraging and cost eagles energy. The Revised DEIS must assess the adverse impact of increase shoreline and water related recreation following dam removal upon resident and wintering bald eagles.

While the DEIS does mention disturbance to bald eagles from trap-and-haul truck traffic under the dam retention scenario, it addresses neither the long-term disturbance to bald eagles which would be associated with the increased recreational traffic activity in the middle reaches of the river under the dam removal scenario nor the impacts of 5 years of construction activity during dam removal. The Revised DEIS must address these impacts in the dam removal alternative.

Comment TR-14 Bald Eagles, Impacts

Reference: Sec 4.2.4.2 through 4.2.6.2.

JR-147 The Revised DEIS should a) correct the numbers of salmon which will be available to bald eagles under each scenario; b) be consistent in judging significance under each scenarios as to the benefits associated with salmon species which would be available to bald eagles during the same months; c) clearly state that bald eagle perching and roosting trees along the river from Glines Canyon to the coast will be lost due to channel migration and flood events; d) note that available trees will be further from the waters edge and that eagle prefer perches close to the water; and e) discuss disturbance factors. Based on this information, the Revised DEIS must

JR-146: The DEIS does not state that trap and haul traffic will disturb bald eagles. If fact, it concludes that the applicant's proposal would not have any unavoidable adverse impacts on bald eagles or other threatened or endangered species (see Section 4.1.4.3). In addition, dam removal activities, which would occur during the summer, are unlikely to disturb bald eagles since their use of the Elwha is limited primarily to the winter (see Section 4.2.4.3).

The staff is well aware of the impacts of human disturbance (e.g., sport fishing and rafting) on bald eagles (Stalmaster and Newman, 1978; Stalmaster et.al., 1992) and agrees that increased recreation could potentially affect the activities of eagles wintering along the river. However, although the DEIS predicts that "the removal of both dams would result in a significant positive impact of dam removal on the quantity and quality of the recreation fishery," it also concedes that "the harvest rate would have to be somewhat curtailed, possibly resulting in more restrictions on seasons or bag limits."

Because increased recreational use of the river would be a secondary effect of dam removal, its effects on eagles are difficult to predict due to uncertainties involving: (1) expected bald eagle use of the river; (2) restoration of the fishery resource; (3) the level and location of recreational use; and (4) future ONP, tribal, and state regulations governing fishing. Consequently, the DEIS did not include an analysis of the potential impacts of a potential increase in recreation on bald eagles that are not yet present along the river. If increased recreation appears to result in significant disturbance to bald eagles in the future, the ONP, state, and tribes could alleviate the problem by restricting recreational activities, particularly during the morning hours when bald eagles do most of their feeding (Stalmaster et. al., 1992).

JR-147: a) See last paragraph of response JR-133.

b) See second paragraph of response JR-142.

c) See second paragraph of response JR-143.

d) See first paragraph of response JR-143.

e) See response to JR-146.

The DEIS clearly concludes in Section 4.2.4.3 that there would be no unavoidable adverse impacts to bald eagles from dam removal. The FWS concurs with this assessment and believes that dam removal would benefit bald eagles (see DOI-215).

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JR-147 cont'd provide conclusions about what the potential impacts on bald eagles may be under the dam removal scenario. Finally, the Revised DEIS should report FWS recommendations with respect to the impact assessment, proposed mitigation measures.

COMMENT TR-15 HEP Analysis - 2

Reference: Sec 4.1.4.2 and 4.2.4.2.

JR-148 The DEIS assesses the amount of habitat that will be available in 200 or 300 years for the Dam Removal alternative and contrast it with the Applicant's proposal analyzed for 50 years. This comparison does not accomplish the intent of HEP studies which is to compare project alternatives over similar time periods. The Revised DEIS must provide a HEP analysis which would include tables indicating cover type area and HSI's at each time step for an analysis covering a common period (perhaps 100 years). The HEP analysis should reflect the adverse conditions under the dam removal scenario during the early years. The analysis should indicate that project lands outside of ONP would return to either forest practices or rural development under the dam removal scenario or include acquisition costs for these lands.

COMMENT TR-16 Inconsistent Land Use Assumptions

Reference: Sec 4.2.4.2, page 4-114, 2nd para, "In conjunction with..."

JR-149 The DEIS states that "habitat quality in the restored reservoir and project areas, over the long term, would be similar to pre-project conditions. This expectation was based on the assumption that the land currently covered by Lake Aldwell would be protected from clear-cutting and/or development." However, on page 4-126, it is stated that "The removal of both dams, reservoirs, transmission lines and project support facilities would convert 759 acres of project occupied lands into alternative uses....The 297 acres occupied by the Elwha Project would be restored to natural conditions. The project occupied lands and adjacent lands owned by the Applicant would probably be managed for timber production, similar to the adjoining lands east of Highway 101 and west of Lake Aldwell. Over 1,000 acres would be available for production and harvest, of which the mature second growth timber, located around Lake Aldwell, would probably be cut first." The Revised DEIS should be consistent in its assumptions and the application of these assumptions.

The Revised DEIS should treat the alternatives in a consistent manner throughout. Lake Mills acreages should appear in Table 4-18. No benefits to wildlife from mitigation lands should be discussed outside Park ownership under the dam removal scenario unless FERC staff propose a land and timber acquisition program and includes its costs.

JR-148: See response JR-132. The HEP conducted by the staff assumed that the land currently under Lake Aldwell would be protected as wildlife habitat but that other lands outside ONP would be managed for timber production (as represented by the "without mitigation scenario" in the HEP conducted by the applicant).

JR-149: Section 4.2.5.2 has been changed to reflect the assumption that land currently under Lake Aldwell would be acquired as part of the dam removal alternative and managed as wildlife habitat.

The acreages for Lake Mills are clearly listed in Table 4-23 (formerly Table 4-18). The DEIS limits the benefits to wildlife from dam removal to ONP and the land currently occupied by Lake Aldwell.

COMMENT TR-17 Revegetation Plan

Reference: Sec 4.2.4.1, page 112, 4th para, "No long-term unavoidable..."

JR-150 The DEIS has determined that "no long-term unavoidable adverse impacts on plant communities would be expected." The DEIS did not project the length of time it would take for restoration of any plant species other than trees. The DEIS describes forest succession on revegetated lands, but lacks a description of exactly how initial revegetation activities would be conducted in the reservoir areas, in the probability of repeat refilling of the reservoirs and the instability of reservoir sediments. The Revised DEIS must include a discussion of the uncertainty involved in efforts to establish native vegetation in an unstable river system and provide a practical revegetation plan.

COMMENT TR-18 Wetland - Riparian Restoration

Reference: Sec 4.2.4.1, page 109, 3rd para, "The dam removal..."

JR-151 Restoration of wetlands and riparian vegetation is especially problematical, and deserves more than a passing reference to the likelihood that these habitat types may be temporarily eliminated or degraded under the dam removal scenario. It is unlikely that comparable wetlands would develop for a long period of time. The Revised DEIS must describe the loss of existing wetland under dam removal and provide an estimate of what types of wetlands would develop under the dam removal alternative and an estimate of when they would develop. In evaluating proposals for new project development, FERC assesses potential loss of wetlands under its own criteria of no net loss of wetlands. The same criteria should be applied to the dam removal alternative, rather than assuming that the wetlands would ultimately be replaced.

COMMENT TR-19 Terrestrial Mitigation Plan

Reference: Sec 4.1.4.2, page 4-41

JR-152 The DEIS is inconsistent in its evaluation of the Applicant's mitigation plan. It states on page 4-41 that "The applicant's proposal would result, overall, in positive effects on wildlife...the proposed wildlife enhancement plan would improve habitat in the vicinity of the Elwha Project for most wildlife species.....the primary long-term affects (sic) of the applicant's proposal on wildlife would be .....(2) positive changes in habitat quality from the implementation of a wildlife enhancement plan on project lands around Lake Aldwell..." Nevertheless the DEIS concludes on page 4-50 that "the staff concurs with the WDW that the plan provides only minimal habitat improvement for most species and lacks an adequate monitoring program."

JR-150: Initial revegetation and sediment management activities are described in Appendix A, Section 3. Revegetation of the reservoir areas with grasses, forbs, and shrubs would occur concurrently with dam removal activities. It is expected that the reservoir areas would support shrub willow and alder stands within 5 to 10 years of dam removal (see Section 4.2.4.1).

JR-151: Section 4.2.4.1 provides an estimate of the amount and type of wetlands expected to develop following dam removal. The staff assumed that, in general, the cover types expected to develop in the restored reservoir areas would resemble pre-project conditions. Consequently, these estimates were based on data provided by the applicant on wetlands that existed along the river through the reservoir areas prior to project construction.

The staff agrees that temporary loss of wetlands from the study area is an unavoidable adverse impact from dam removal. The wetland in the delta of Lake Aldwell represents most (88 percent) of the wetland acreage likely to be affected by dam removal. To facilitate replacement of this wetland, the staff recommends that sediments in the delta area be graded in a manner conducive to wetland development (see Section 4.2.4.1).

Wetlands can develop quickly, given appropriate soils and hydrology. The natural river hydrology resulted in wetlands along the river prior to project construction, and these are likely to redevelop following dam removal. The fines that are part of the sediments, particularly in Lake Aldwell, would be conducive to the establishment of wetland vegetation. To deal with the possibility that wetlands would not reestablish along the new river channel, the staff has added a recommendation to Section 4.2.4.1 that developing wetlands along the river be monitored at periodic intervals. If it appears that dam removal would result in a net loss of wetlands, a mitigation plan would be developed and implemented. This plan would likely involve creating wetlands at suitable locations along the river.

JR-152: The basic premise of the applicant's wildlife improvement plan, which involves protection of about 900 acres of land and some habitat enhancement, is appropriate. The plan was considered inadequate by the staff primarily because it lacks a monitoring and maintenance program to ensure that improvement measures are effective and continued over the entire license period.

In addition, the staff recommends that "the Applicant, in consultation with WDW, ...rerun the HEP analysis to include forage available for these species (deer and elk) on lands outside the project boundaries. This analysis would determine if forage during the winter period is limiting deer and elk use of the lower Elwha. The results should be used, in consultation with WDW, to plan a comprehensive habitat improvement program for deer and elk on the lands owned by the applicant." This conclusion appears to have resulted from a misunderstanding of the intent of the mitigation plan.

The Revised DEIS should clarify that the Applicant's mitigation plan is intended to enhance old-growth forest and to manage for a diversity of species, not to increase deer and elk populations in the Lower Elwha Basin. The DEIS is critical of the Applicant's plan because the plan does not include big game forage enhancement projects. At the same time, the DEIS recommends that the HEP be re-run to show forage available on adjacent lands, which would in fact show that forage enhancement on project lands would be of little benefit to deer and elk. The Revised DEIS should review the extensive meeting notes and correspondence already provided to FERC which report the views shared with the resource agencies and the Applicant that the best use of project lands was to encourage the growth of forest with old growth characteristics. JR-152 cont'd

Decisions regarding mitigation and enhancement on project lands were made in consultation with the USFWS and WDW. It was further agreed by all participants that enhancement of big game habitat was not a high priority in the Elwha Valley. It was agreed that there was an abundance of forage opportunity on cut-over lands for miles in every direction around the project lands, which could be used by deer and elk. It was agreed that the HEP would be run only on project lands, and that it would likely show low HSI values for deer and elk. It was agreed that HSI values for deer and elk could be improved by creating and maintaining forage areas on project lands, but that such management would not significantly benefit deer and elk. It was agreed that "chasing HEP points" was not the goal of management for project lands.

As is documented in the Mitigation Plan itself, and in the record of consultation included in the FERC filing dated April 16, 1990 (HEP Analysis and Wildlife Mitigation Plan), all participants agreed that old growth forest is a high priority for resource management agencies on the Olympic Peninsula and that the mitigation plan would focus on enhancement of old-growth attributes in currently-existing mature forest on project lands. In accordance with the agreements described above, the Mitigation Plan was designed as habitat, not species, enhancement.

COMMENT TR-20 WDW's Deer/Elk Model

JR-153 Reference: Sec 4.1.4.2, page 4-50.

The DEIS also states that "The analysis of the effects of the wildlife enhancement plan on deer and elk has several problems that affect its accuracy. Specifically, the models used to

JR-152: cont'd The staff understands that the goal of the applicant's proposed wildlife enhancement plan is to protect the forest stands surrounding Lake Aldwell and promote the development, over time, of old growth. However, the applicant also proposes several management prescriptions (specifically, the strip and clearcuts) that do not seem to directly relate to this goal. The application states that these patch and strip clearcuts are designed to promote the establishment of browse species for deer and elk forage. If the agencies all agree that forage is available on adjacent lands and that there are problems with the HSI models for elk and deer, the staff questions the rationale for including specific forage enhancement measures in the plan. The staff-recommended measures in Section 4.1.4.2 are designed to determine whether or not a forage improvement plan is necessary. If such a plan is not necessary, the strip and patch cuts should be dropped unless they have a purpose other than forage improvement, which is not obvious and unexplained in the application. If a forage improvement plan is necessary, the applicant's current plan needs to be more comprehensive and should be developed in conjunction with the agencies.

JR-153: The staff understands that the decision to use the WDW deer and elk models was made by the HEP team. Several agencies appear to have recognized problems with limiting the analysis to the study area (see comments DOI-72 and SOW-164). The same acreages agreed on by the HEP team could be used to run the models but the interspersion index, as determined by the distances to forage and cover, should be modified to include land adjacent to the project.

determine habitat quality for deer and elk have an error in the winter stress component." The last sentence could more correctly read:

JR-153 cont'd

"Specifically, the Applicant was required to use Washington Department of Wildlife (WDW) models to determine habitat quality for deer and elk. These models contained several errors, including the component relating to winter stress. Some of these errors were first brought to the attention of WDW personnel by the Applicant's consultants in January of 1988 and again and in greater detail in January of 1990, and some were brought to the attention of the Applicant's consultants by WDW personnel. The Applicant's consultants expressed both reluctance to use the models in error and willingness to participate in a thorough review of the models." WDW now seems close to a revision of the models, and the Applicant's consultants would re-run the HEP for deer and elk when the models are available. However, for reasons explained above, the HEP would be re-run on the same acreages that were agreed upon by the interagency work group.

COMMENT TR-21 Elwha, Replacement Wetlands

Reference: Sec 4.2.4.1, page 4-106, 1st para, "Removal of both..."

JR-154

The DEIS states that new wetlands would develop along the river following dam removal. The Revised DEIS should provide an analysis of where and when new wetlands would develop, should assess whether the loss of existing wetlands and the delay until new wetlands develops results in a net loss of wetland habitat, and whether this would comply with FERC's policy of 'no net loss of wetlands values.'

COMMENT TR-22 Elwha, Restored Reservoir Lands

Reference: Sec 4.2.4.2, page 4-114, 2nd para, "In conjunction with..."

JR-155

The DEIS on page 4-14 states that the Lake Aldwell basin will be restored to "natural cover types" and protected from clear cutting in the future. On page 4-126 the DEIS assumes that this area will return to timber rotation. The Revised DEIS should be consistent and in the absence of a plan to protect "project lands" after dam removal, it should assume they enter either timber rotation or rural residential development.

COMMENT TR-23 HEP, Restoration Scenarios Not Parallel

JR-156

Reference: Sec 4.2.4.2, page 4-114, 2nd para and Table 4-19.

The DEIS states in the text and in Table 4-19 that there are substantial restoration benefits for dam removal. This is based on the assumption that the reservoir lands have returned

JR-154: See response JR-151.

JR-155: See response JR-149.

JR-156: See response JR-132.

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JR-156 cont'd to natural vegetation. This process would take 200 to 300 years before old growth attributes would be present. The basis of a HEP analysis is to define parallel scenarios. The DEIS analysis appears to set the Applicant's scenario as 1996 to 2046 and the Dam Removal scenario as 1996 to 2300 or 2350, plus or minus 100 years. The Revised DEIS should contain a standard HEP analysis conforming to the procedure laid out in the Fish and Wildlife Service's 1-ESM-1, 1980.

COMMENT TR-24 HEP, Correct AAHU's

Reference: Sec 4.2.4.2, page 4-114, 4th para, "Based on the results..."

JR-157 The DEIS states that there will be 16% and 20% increases in AAHU's in the Elwha Valley. The increase is not for the Elwha Valley, it is for the more limited study area. For the Elwha Valley in the area of the projects the increase might be 0.1%. The Revised DEIS should be corrected by defining the area under analysis.

COMMENT TR-25 HEP, Comparing Project Alternatives

Reference: Sec 4.2.4.2, page 4-114 through 4-121.

JR-158 It is not clear whether the DEIS is comparing a dam retention and a dam removal scenario or current conditions and a dam removal scenario. The Revised DEIS should present analysis for parallel scenarios.

COMMENT TR-26 Osprey

Reference: Sec 4.2.4.2, page 4-116, last para, "Removal of the reservoir..."

JR-159 The Revised DEIS should state that the two pair currently resident on the river would be displaced during decommissioning and for 4-10 years following due to human activity, high turbidity, and loss of foraging opportunities.

COMMENT TR-27 Piliated Woodpeckers

Reference: Sec 4.2.4.2, page 4-118, 2nd para, "There is currently..."

JR-160 The DEIS compares dam retention and dam removal scenarios and suggests a 48% improvement for piliated woodpecker. The Revised DEIS should advance the Applicant's scenario as far into the future as the DEIS advances the dam removal scenario in order to make its comparison.

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JR-157: Section 4.2.4.2 has been changed to indicate that the area of analysis is the terrestrial study area and not the entire Elwha Valley.

JR-158: The HU's presented in the DEIS represent the long-term gain in habitat expected to occur in the restored reservoir areas only. For example, the reservoirs currently provide zero HU's for the Douglas squirrel. At some point in time 300 years or so in the future, these same areas would be expected to provide about 344 HU's for this species (see Section 4.2.4.2).

The AAHU's presented in the DEIS represent the short-term effects (50 years) of all alternatives on wildlife habitat in the study area. Consequently, the dam removal and the dam retention alternatives are compared to the same baseline scenario. This scenario is the one developed by the applicant, which assumes that most of the study area adjacent to Lake Aldwell would be managed for timber production and would be clearcut within 5 years.

JR-159: Section 4.2.4.2 discusses the effects of increased turbidity in the river following dam removal and the potential displacement of two pairs of osprey that nest in the Elwha Valley. The effects of disturbance from dam removal activities on this species is also discussed in this section.

JR-160: The 48 percent increase in pileated woodpecker HU's presented in the DEIS represents the long-term development of habitat in the restored reservoir areas. In the short-term (50 years), there would be no increase in pileated woodpecker habitat in the reservoir areas. In fact, the AAHU's presented for the short-term effects of dam removal reflect a decrease in pileated woodpecker habitat because of logging on the lands adjacent to Lake Aldwell.

COMMENTS OF JAMES RIVER II, INC.

COMMENT TR-28 Benefits of Fish Restoration

JR-161

Reference: Sec 4.2.4.2, page 4-118, 5th para, "The factors responsible..." and Table 4-20.

The DEIS analysis and Table 4-20 assume fisheries management objectives will be for maximum sustained yield (MSY). Under this assumption, the numbers of chinook, coho, and steelhead returning to spawning grounds would be similar for both the dam retention and dam removal scenarios. Prospects for pink and chum restoration are poor. Tables 8a and 8b in Appendix 2 of this document provide corrected escapement numbers for salmon and steelhead.

Table 4-20 in the Revised DEIS should be revised to compare existing conditions, dam retention and dam removal. Current conditions would include substantial hatchery and rearing channel production. The Revised DEIS should include revised numbers of fish and incorporate MSY management when assessing terrestrial benefits.

COMMENT TR-29 Adverse Impacts Are Temporary

JR-162

Reference: Sec 4.2.4.2, page 4-121, 2nd para, "Staff recommendations to..."

The DEIS does not assess the likelihood for successful implementation of recommendations. The Revised DEIS should provide technical data that is sufficient for a reviewer to assess the likelihood of successful implementation of the staff's recommendation.

RESPONSES TO JAMES RIVER II, INC.

JR-161: The staff agrees that escapement for coho, chinook, and steelhead would be simila for all alternatives and this assumption is reflected in Tables 4-15, 4-26, 4-31, and 4-36 (formerly Tables 4-12, 4-20, 4-25, and 4-29). The staff does not agree that the potential for restoration of chum and pink salmon runs is poor for the dam removal alternative (see responses JR-228 through JR-233).

To evaluate benefits of increased fish production on wildlife, each alternative is compared to present conditions (see column labeled "Increase in Biomass Over Current Conditions" in Tables 4-15, 4-26, 4-31, and 4-36). Hatchery production i included in these estimates, where appropriate. However, most of the coho and about 50 percent of the chinook return to the hatchery to spawn and are not available to wildlife. Alternatives are compared in Section 5.0.

JR-162: The methods proposed by the staff to stabilize the sediment disposal terraces, control siltation, and restore anadromous fish runs go well beyond standard practices and include redundant measures to help ensure success. There is, however, no absolute guarantee of success, just as there is no guarantee that all of the applicant's proposed measures would succeed.

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COMMENT TR-30 Spotted Owls, No Adverse Impact

Reference: Sec 4.2.4.3, page 4-121, 1st para, "Removal of both..."

JR-163 The DEIS's conclusion with respect to the absence of adverse impacts to spotted owl can not be accepted in the absence of specific information on spotted owl activity within 2.2 miles of decommissioning activity. The DEIS, page 3-60, indicates the presents of spotted owls in the valley and the existence of spotted owl habitat adjacent to Lake Mills. Consistent with FERC practices, the Revised DEIS must provide information on the presence or absence of spotted owls in the area, an assessment of possible impacts, and necessary mitigation measures.

COMMENT TR-31 Natural Conditions in 20 Years

Reference: Sec 4.2.4.4, page 4-124, 1st para, "Removal of both..."

JR-164 The DEIS's assumption that vegetation and wildlife would return to natural conditions within 20 years. The Revised DEIS should use HEP to assess conditions in 20 years under each scenario.

JR-163: See responses JR-133 and JR-140.

JR-164: The staff has conducted a HEP that assesses conditions within 20 years for each alternative. The results of this HEP are included in Sections 4.2.4.2, 4.3.4.2, and 4.4.4.2. See response JR-132.

COMMENT TR-32 Pristine Production Estimate

Reference: Sec 4.2.4.4, page 4-124, 2nd para, "Removal of both..."

JR-165 The DEIS incorrectly estimates fisheries production. The Terrestrial Resources section of the Revised DEIS must be based upon corrected fish production numbers and an understanding of MSY management.

JR-165: The staff believes that fish production estimates presented in the DEIS are correct and are therefore appropriate to use in the terrestrial resources analyses. See responses JR-228 through JR-233.

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J. LAND USE AND COMPREHENSIVE PLANS

1. Introduction

Section 10(a)(2) of the Federal Power Act requires FERC to consider the extent to which a project is consistent with comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. The DEIS addresses Section 10(a)(2) in Section 5.3, beginning at page 5-15. The DEIS evaluates eight plans, five qualifying under Section 10(a)(2), and three other resource plans. The staff concludes that, although no alternative would be entirely consistent with all of the relevant plans, "the removal of both dams would be most consistent with the overall direction of the relevant plans."

JR-166 The evaluation of comprehensive plans in the DEIS is incomplete and inconsistent. The DEIS fails to identify the two comprehensive plans which qualify under Section 10(a)(2) and address energy generation. The Northwest Power Planning Council's Northwest Conservation and Electric Power Plan (the Northwest Power Plan) and the U.S. Department of Energy's National Energy Strategy. These two comprehensive plans stress the national and regional need for energy resources, both emphasize the benefits of meeting such needs through development of renewable resources such as hydropower, and both encourage expansion of generation at existing hydroelectric power projects. The conclusion of the DEIS that "the removal of both dams would be most consistent with the overall direction of the relevant plans" results from the fact that the two comprehensive plans which address energy are not even evaluated in the DEIS. The DEIS also misconstrues some of the other plans as they apply to the alternatives, consistently overstating the impacts from James River's dam retention proposal and understating the enormous risks and adverse environmental impacts (including violation of state statutes) that would result from dam removal.

2. Olympic National Park Plans

JR-167 The DEIS misstates the content of the National Park Service (NPS) plans that apply to the Olympic National Park (ONP). The DEIS creates the impression that the ONP plans support removal of the Glines Canyon Project. In fact, just the opposite is the case. Review of the relevant plans reveals that NPS has: 1) specifically considered the Project in its plans for the ONP; 2) recognized the Project's right to exist; and 3) formulated its resource management plans and directives to account for the continued operation of the Project.

On page 3-77, the DEIS discusses the ONP Master Plan and asserts that it calls for "the restoration and maintenance of the primary natural resources of the park." According to the DEIS, the Plan's "essential stated objective is to restore and perpetuate environmentally regulated ecosystems in the park." From this broad statement of the ONP policy goal, the DEIS assumes that dam removal is necessary to achieve this objective. This assumption is incorrect.

JR-166: The staff has added the analysis of the power planning aspects of the Northwest Conservation and Electric Power Plan to Sections 4.1.5.2 and 5.3. The U.S. Department of Energy's National Energy Strategy is not listed as an approved comprehensive plan by the Commission.

JR-167: NPS corrections to the statements of plan content have been added to Section 3.6.4. While the comprehensive plans are open to interpretation, the staff feels that the consistency factors assigned to the alternatives represent appropriate judgements. Consistency is not only a choice between consistent and not consistent, but of varying degrees, since some aspects of the alternatives are frequently consistent with some aspects of a particular comprehensive plan.

What the DEIS completely ignores is that in preparing the Master Plan, NPS gave specific consideration to the Glines Canyon Project and determined that no modifications were necessary to meet ONP management goals. This discussion is contained in the Final Environmental Impact Statement prepared in conjunction with the Master Plan. In the 1973 DEIS for the Master Plan, NPS did not discuss the Glines Canyon Project, which was subject to relicensing in 1976. The Federal Power Commission raised this issue in its November 29, 1973 comment letter to NPS on the DEIS. NPS responded in the FEIS by discussing the relicensing process and stating "this master plan does not suggest any major changes in facilities" at the Glines Canyon Project (NPS, 1976). Moreover, in its specific response on the FERC letter, NPS determined "[n]o proposal in the master plan will have any effect upon the continued operation or possible relicensing of the Glines Canyon Project" (see Response to Comments, NPS, 1976, emphasis added).

Thus, although the Master Plan may set forth a general policy goal of ecosystem restoration, its discussion of the Glines Canyon Project supports relicensing and continued project operation. Not only does the Master Plan fail to support dam removal, it actually declares that ONP management goals are not to be construed or applied so as to interfere with the continued operation of the Project.

JR-167 cont'd

The DEIS also fails to put the ONP Land Protection Plan ("LPP") in its proper perspective. On page 3-77, the DEIS states that the LPP does not identify the area occupied by the Glines Canyon Dam "as a priority for acquisition." What the DEIS fails to do is discuss the significance of this finding.

The land protection planning process is the mechanism used by the Department of the Interior to identify what measures are necessary to protect federal lands from activities occurring on private lands, especially inholdings. (See 47 Fed. Reg. 19,784 [Secretary's policy on land protection planning]; 48 Fed. Reg. 21,121 [NPS policy on land protection planning]). This planning process takes place in two steps. First, threats to national park management goals resulting from activities on private lands are identified. Second, when problems are identified, alternatives are considered to resolve the conflict. (See 48 Fed. Reg. 21,112, 21,124-125.) Thus, if an LPP does not identify an inholding as being the target for federal acquisition or some other action, NPS has determined that park management objectives can be satisfied without any changes to current activities occurring on that property. As stated in the NPS policy for land protection planning, "[t]he plan must identify specific protection methods and assess the ability of various alternatives to achieve management objectives." (See 48 Fed. Reg. 21,125.)

In the LPP for the ONP, NPS gave detailed consideration to potential resource management conflicts resulting from all significant inholdings. Although the LPP identifies numerous inholdings that result in nonconforming uses and must be acquired or dealt with in some other manner, NPS determined that the Glines Canyon Project is not such an area. In fact, the LPP states NPS's view that "[t]he dam was built prior to the establishment of the park and the park was created in full recognition that the dam existed and could continue to exist." LPP, at 12. The LPP identified an upstream parcel owned by the dam owner as a priority for

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JR-167 cont'd

acquisition, but made no such recommendation for acquisition or other action involving the site occupied by the Glines Canyon Project. The LPP identifies five priorities for acquisition to accommodate resource protection, and the Glines Canyon Project is not mentioned. (See the LPP p. 17-18.) These findings were made in 1983, seven years after the Glines Canyon Project license expired. They were reaffirmed by the ONP Superintendent and Regional Director on December 14, 1989, and January 30, 1990, respectively.

The DEIS incorrectly states that the ONP Resources Management Plan (RMP) does not address any issues specific to the Elwha drainage. In fact, the RMP includes several discussions of the Elwha River fisheries restoration issue. (See RMP 4:8.) Like the other NPS plans, the RMP does not conclude that dam removal is necessary to achieve the ONP natural resource management objectives. In fact, the RMP explains that several options for fisheries restoration, ranging from increased hatchery production in the lower river to removal of both dams are under consideration. Thus, the RMP keeps all options open for satisfying ONP management objectives through means other than dam removal.

The DEIS is incorrect when it asserts "[t]he dam removal alternative is generally consistent with ONP plans, because the restoration effort is expected to restore natural conditions on lands and waters previously altered by human activity." Dam removal is inconsistent with the LPP, which recognizes the "right" of the Project to exist, and the DEIS fails to recognize that NPS has made an exception to its "complete ecosystem restoration" goals in the ONP Master Plan to accommodate the Glines Canyon Project.

These serious errors in the DEIS should be corrected. Even if the NPS now decides to advocate dam removal, it is not accurate to say that dam retention is inconsistent with existing ONP plans, or that dam removal is consistent with such plans.

3. Washington Department of Fisheries Hydro Guidelines

JR-168

The DEIS inconsistently applies the Washington Department of Fisheries (WDF) Hydro Guidelines in the land use section, and the DEIS is internally inconsistent with conclusions reached in the water quality impact assessment for dam removal. In assessing consistency with the Guidelines, FERC staff focused on fish passage issues and omitted reference to specific water quality criteria for sediment, turbidity and bedload. The thresholds of significance defined in the Guidelines are: no introduction of additional sediment, turbidity limited to a 10% increase over background, and no change in bedload. Omission of these criteria from the assessment of dam removal in the land use section is inconsistent with the Water Quality Section in the DEIS.

The water quality section assessing dam removal states that dam removal will result in adverse impacts to water quality with high concentrations of suspended sediments and high turbidity levels threatening water supplies for industrial uses, the WDF rearing channel, water used by the City of Port Angeles and the Elwha Tribal Hatchery (see Comment WQQ-15, 18). Specifically the DEIS states that suspended sediment loads of 300 to 500 mg/l would be

JR-168: While the WDF Hydroelectric Project Assessment Guidelines contain water quality criteria in thresholds of significance, the main significance of the guidelines to the Elwha/Glines Canyon projects is on long-term sustainability of fish passage. The staff has made their consistency determination based upon the guidelines' main emphasis. In addition, as described in Sections 4.2.2 and 5.2.2, the effect on physical water quality from dam removal would occur up to 6 years after removal, while the guidelines focus on long-term objectives. As discussed in Section 4.2.3, the long-term water quality effects of dam removal on resident and anadromous fish are expected to be severe during the last 2 to 3 years of construction and for a full 4 to 6 years thereafter. While some specific water quality parameters might be violated by dam removal, the WDF's role in assessing violations or potential losses involves a qualitative risk assessment. As stated in the guidelines, the WDF's responsibility is to "preserve, protect, and manage the salmon resources, including habitat, of this state." Water quality parameters have been added to Section 4.2.5.2 and the consistency determination has been revised to indicate the dam removal alternative is generally consistent with the WDF Hydroelectric Assessment Guidelines.

JR-168 cont'd

expected during the summer construction period and turbidity values of 100 to 200 NTU, significantly higher than the background 70 NTU, would be predicted during dam removal. These high turbidity values predicted in the DEIS would exceed the WDF Guidelines (10% over background) by 100-400%. In the water quality section, the DEIS concludes that state water quality standards would be violated (WAC Sec. 173-201-045).

Clearly, the DEIS cannot conclude in the land use section that dam removal would be consistent with WDF Guidelines when in the Water Quality Section it concludes that violation of water quality thresholds would occur. The Revised DEIS should be revised to show that dam removal is inconsistent with the WDF Hydro Guidelines because the thresholds of significance for sediment, turbidity and bedload would be violated.

4. Clallam County Comprehensive Plan

JR-169

The DEIS evaluates the Clallam County Comprehensive Plan by assessing economic impacts to the County economy. The DEIS, however, uses only the portion of the comprehensive plan dealing with Energy Facility Site Standards in the plan. This section was specifically written to prohibit oil terminals and pipelines in Clallam County. Nowhere in the Plan can it be found that continued operation of existing energy facilities, of any kind, would be an incompatible land use.

The DEIS does not evaluate economic impacts from dam retention or dam removal in a consistent manner. For example, the DEIS concludes that James River's proposal for dam retention is inconsistent with the Clallam County Comprehensive Plan because recreational fishing opportunities will decrease thereby reducing tourism and decreasing revenue brought into the County. To reach this conclusion FERC staff have focused on one aspect of the Projects' effect on the Clallam County's economy (recreational fishing) while omitting other aspects of James River's proposal that offset these losses. Economic additions to the County economy include an increase in project related employment (32 person-years) during construction and operation of proposed facilities and increased taxes ($257,000 in 1991). The Revised DEIS should state that James River's proposal is consistent with the Clallam County Comprehensive Plan since there are no adverse impacts.

The DEIS concludes that dam removal is consistent with the Clallam County Comprehensive Plan due to the "tremendous increase" in the recreational fishery and related tourism. This assessment is based upon an incorrect assessment of fisheries benefits. The DEIS assumes that the dam removal plan will work as planned and that restoration of the fisheries will proceed as planned. It has been demonstrated that the dam removal plan will not work (See Section F of these comments). The DEIS does not weigh the loss of taxes paid to the County through the continued operation of the project ($257,0000 in 1991). Also omitted in this discussion is the loss of terminal sport, commercial and tribal fishery during the construction period and during the restoration period estimated to be 12 years. The DEIS also omits the costs

JR-169: While it is true that the Clallam County Comprehensive Plan does not directly address the continued operation of existing energy facilities, the plan addresses other aspects of development such as recreation and tourism that are vitally important to Clallam County's economy. As discussed in Section 4.1.5.2, the loss of any sports fishing resources would slightly affect tourism in this area. The staff has therefore revised the consistency determination to indicate that the applicant's proposal is partially inconsistent with the Clallam County Comprehensive Plan (Section 4.1.5.2).

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JR-169 cont'd associated with water quality problems resulting from dam removal. The City of Port Angeles and the industrial users estimate it would cost $35,7000,000 to protect their water supplies with an annual O&M of $2,762,000. See comments submitted by the City and Daishowa America.

The Revised DEIS should be revised to state that dam removal is inconsistent with the Clallam County Comprehensive Plan.

5. Council's Regional Power Plan

The 1986 Northwest Power Plan was recognized by FERC as a qualifying comprehensive plan qualifying under FPA Section 10(a)(2) immediately after enactment of that provision in October, 1986. See, e.g., Commercial Energy Management, 37 FERC 62, 267 (December, 1986). It has been continuously recognized as such, and most recently was included in FERC's recently published list of "Comprehensive Plans Filed with the Commission Pursuant to Section 10(a)(2)(A) of the Federal Power Act as of April 1, 1991." It should have been addressed as a comprehensive plan in sections 4.1.5, 4.2.5 and 5.3 of the DEIS.

JR-170 In the many cases where FERC has considered the consistency of a project with the Northwest Power Plan, FERC has performed an economic analysis similar to that performed in Section 2.7.2 of the DEIS, recognizing the emphasis of the plan on economical power generation to serve the growing power needs of the Pacific Northwest Region. Section 2.7.2 properly recognizes that power planning in the Pacific Northwest is done on a regional basis, and that the elimination of a generating resource anywhere in the region results in an adjustment in the region's load/resource balance. The dramatic results of the DEIS analysis of regional power cost, shown in Table 2-12 on page 2-31, must be discussed in the comprehensive plan discussion (sections 4.1.5, 4.2.5 and 5.3). According to this analysis, the present value cost of dam retention is $39,113,000 and the present value cost of dam removal is $245,076,000, with $164,221,000 of the dam removal cost being attributed to the cost for the region to obtain alternative power to replace the generation from the dams.

Assuming, for this discussion only, that the analysis in Section 2.7.2 is accurate, the selection of an alternative that would cost over $245 million (including replacing the region's lost energy at the region's marginal cost of resources) rather than an alternative that would retain the same generation at a cost of $39 million would be inconsistent with the economical power objectives of the Northwest Power Plan. This analysis must be included in the section on comprehensive plans.

Since the DEIS was prepared, the Northwest Power Planning Council (the Council) has adopted a new plan, the 1991 Northwest Power Plan. This plan, like its predecessor, notes the regional need for new resources and stresses renewable resources, particularly additional generation at existing hydropower projects. FERC should consider the consistency of the alternatives in the DEIS with this 1991 Northwest Power Plan. Again, particularly from an

JR-170: Comment noted. The comprehensive plan analysis has included reference to the consistency analysis for the Northwest Power Planning Council's Northwest Conservation and Electric Power Plan.

JR-170 cont'd economic standpoint, dam retention is consistent and dam removal inconsistent with this comprehensive plan.

6. National Energy Strategy

JR-171 On April 26, 1991, the Secretary of Energy filed a Notice of Intervention in the FERC proceedings for the Glines Canyon and Elwha projects. In this intervention, the Secretary emphasized the importance of National energy self-sufficiency and hydropower in particular. In this regard, the Secretary specifically recommended that FERC consider the recently published National Energy Strategy as a comprehensive plan pursuant to Section 10(a)(2) of the Federal Power Act. James River concurs in this recommendation.

The National Energy Strategy stresses the Nation's need for additional electric generating resources, particularly resources that reduce reliance on foreign oil. It recognizes the importance of hydropower in a strategy of energy independence, and particularly encourages increasing generation at existing hydro projects. Dam removal on the Elwha would violate this basic thrust of the National Energy Strategy. FERC should identify the National Energy Strategy as a comprehensive plan, and recognize that dam removal would be inconsistent with it and dam retention consistent.

JR-171: While the National Energy Strategy might be considered a comprehensive plan, it has not been qualified by the Commission on the *Revised List of Comprehensive Plans* of December 3, 1991.

7. Land Use Comments

JR-172

COMMENT LU-1 Dam Retention Has "Adverse Effects"

Reference: Sec 4.1.5, page 4-55, "Land-Use"

The DEIS is unclear how the Applicant's proposal would have adverse impacts upon existing land use.

JR-173

COMMENT LU-2 ONP's Management Plan

Reference: Sec 4.1.5.2, page 4-56, 3rd para, "The applicant's proposal would..."

The DEIS is in error in its analysis of ONP's Management Plans. See Section discussion above. The Revised DEIS should correctly report ONP's Management Plans.

JR-174

COMMENT LU-3 WDF's Hydro Assessment Guidelines-1

Reference: Sec 4.1.5.2, page 4-57, "The Applicant's proposal is substantially inconsistent with WDF Hydroelectric Project Assessment Guidelines."

The DEIS assess the Applicant's proposal as inconsistent with WDF guidelines but fails to assess adequately the dam removal option using the same guidelines. The Revised DEIS should identify that the dam removal alternative would violate the guidelines for suspended sediment, turbidity and bedload. See Comment LU-8.

JR-175

COMMENT LU-4 Elwha, Boat-in Campsite

Reference: Sec 4.1.5.2, page 4-57, 3rd para, "The applicant's proposal..."

The DEIS states "The Applicant's proposal ...(for) the boat in campground facility is not a permitted use within Lake Aldwell's natural shoreline designation..." The Applicant's proposal addresses an existing problem of casual camping on the shore of Lake Aldwell. A campsite set back as far as the DEIS recommends would probably be ignored by users in favor of the current, shoreline campsites. The Applicant, however, is willing to relocate the proposed campsite or to eliminate boat-in campsites from the proposed recreation plan.

JR-172: The minor effects on land use is described in Sections 4.1.5.1 and 4.1.5.2.

JR-173: See responses JR-11 and JR-167.

JR-174: See response JR-168.

JR-175: Comment noted.

COMMENT LU-5 Air Quality Standards

JR-176 Reference: Sec 4.2.5.1, page 4-125, 3rd para, "The boring of..."

The DEIS fails to evaluate whether decommissioning activities can be performed without violating Class I Air Quality Standards within ONP. The Revised DEIS should address this issue.

COMMENT LU-6 Future Use of Project Lands

Reference: Section 4.2.5.2 page 4-126, 3rd para, "The 297 acres..."

JR-177 The DEIS is not consistent in determining future uses of Project Lands (see TR-16). The Revised DEIS should identify that with dam retention, project lands would be managed for wildlife benefits and that with the dam removal scenario, in the absence of project lands being purchased, the lands would become commercial forest lands or rural residences.

COMMENT LU-7 "Tremendous" Production Potential

Reference: Sec 4.2.5.2, page 4-127, 3rd para, "The dam removal...SCORP..."

JR-178 The DEIS's describes recreation fishing potential as "tremendous" following dam removal. The Revised DEIS should reconsider this assessment following correction of fish production numbers and an analysis of harvest allocation. The reassessment will indicate little if any change in salmon sport fishing and harvest and reduced sports harvest of steelhead. The analysis should identify what proportion of the total harvest will benefit the Port Angeles region. Such an analysis would more clearly define recreational "benefits." (See Table H-1 and Appendix 2 Tables 11 to 16.)

COMMENT LU-8 WDF's Hydro Assessment Guidelines - 2

Reference: Sec 4.2.5.2, page 4-127, 4th para, "The dam removal...WDF..."

JR-179 The DEIS states "The Dam Removal Alternative is fully consistent with WDF Hydroelectric Project Assessment Guidelines." The WDF Guidelines state that any project that creates a loss of habitat will be opposed and establishes specific thresholds for several impact parameters. (Table 1 - Thresholds of Significance). These threshold levels are (in part):

JR-176: Section 4.2.5.1 indicates that construction procedures would be required to meet Class I standards. These standards can be met if proper construction techniques are used.

JR-177: The EIS indicates the scenario suggested for lands above Lake Aldwell.

JR-178: Section 4.2.5.2 has been revised to indicate the short-term reduction in fishing opportunities.

JR-179: See response JR-68.

JR-179 cont'd

Impact Parameter	Threshold
Sediment	No introduction of additional sediment into the stream.
Turbidity	Background ≤ 50 NTU, an increase of ≤ 5 NTU Background > 50 NTU, an increase of ≤ 10%
Bedload	No change in amount, quality or stability of spawning or rearing habitat.

The Revised DEIS should apply the guidelines consistently to each alternative. Clearly, the application of these criteria to the dam removal alternative would judge there to be significant adverse effects, and thus dam removal would be contrary to WDF Guidelines.

COMMENT LU-9 Clallam County's Comprehensive Plan

Reference: Sec 4.2.5.2, page 4-127, 3rd para.

JR-180

The DEIS states "The Dam Removal Alternative is... generally consistent with the Clallam County Comprehensive Plan." The short and mid term impacts on Tribal, sports and non-Tribal commercial fisheries (as identified in the DEIS) could have a significant adverse impact on Clallam County. Appendix 2 provides revised harvest estimates and an economic analysis for the alternatives. Restoration will cause significant adverse impacts in the near term to those sectors of the economy dependent upon existing tribal, sports and commercial fisheries. Appendix 4 indicates that each alternative provides less economic benefits then the existing conditions. The Revised DEIS should identify the profound short and mid term impacts upon tribal fisheries and the fact that there is no net economic benefit over a 50 year period of analysis.

The viability of the Daishowa mill is critical to the economy of Clallam County. In the absence of specific programs to provide replacement power at competitive prices, the impact of decommissioning the projects should be viewed as adverse and hence contrary to the Comp Plan.

COMMENT LU-10 "Some Curtailment of Harvest"

JR-181

Reference: Sec 4.2.8.4, page 4-137, 1st para, "No unavoidable adverse..."

The DEIS states that there will be "Some interim curtailment of harvest." but does not quantify "harvest curtailment." The Revised DEIS needs to quantify sports, commercial and Tribal harvest by species and by region. Appendix 2 shows significant impacts on sports,

JR-180: Section 4.2.5.2 has been revised to indicate the short-term reduction in fishing opportunities.

JR-181: Section 4.2.8.4 has been revised to clarify the extent of the curtailment as estimated by the staff.

JR-181 cont'd commercial and tribal fisheries which would be characterized as adverse under the Clallam County Comprehensive Plan.

COMMENT LU-11 Impacts to Fisheries

Reference: Sec 5.1.1, page 5-5.

JR-182 The DEIS summarizes the impacts to anadromous fish under both the dam retention and dam removal scenarios. There is no mention of the fact that sediment-related impacts to fish during and following dam removal would be severe, causing direct mortality to in-river fish as well as severe impacts to spawning habitat. No mention is made of the fact that the WDF rearing channel would also be non-functional during and for several years following dam removal. Ignoring severe impacts such as these is misleading. The Revised DEIS must address these oversights. FERC should also discuss the distribution of benefits (or disbenefits) under existing conditions, dam retention and dam removal. In the absence of such a discussion it is not possible for the public to make informed comments.

JR-182: The sediment-related impacts discussion has been expanded in Section 4.2.3.1. The effects of these impacts have been added to Section 5.1.1.

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K. RECREATIONAL AND AESTHETICS RESOURCES

1. Recreation Discussion

JR-183 In the analysis of dam retention, the DEIS immediately focuses on "reductions in marine and freshwater sports fishing harvest and possibly more restrictive regulations" required to achieve restoration. The conclusion reached in this section is that the impact of dam retention on recreation is negative because of overall harvest and harvest rate reductions necessary to protect wild stocks. While this assessment is generally correct, it also applies to the dam removal alternative. A Revised DEIS must reassess dam retention and dam removal in light of a corrected fisheries analysis. Such an assessment will show that there would not be a perceptible change in local saltwater sports fishing for chinook or coho. For steelhead, there would be severe harvest restrictions during dam removal and restoration; NRC estimates a moratorium period of approximately 12 years (Appendix 2). The steelhead harvest never returns to the current level with either alternative. The DEIS needs to be revised to show an analysis of the impact of these restrictions and how they balance against proposed recreation improvements and enhancements.

The dam removal section states that this alternative "would greatly benefit both marine and freshwater sports fishing." There is no mention in this section of the need for a harvest moratorium of 12 years to preserve native fish stocks during dam removal (reference section 4.2.3.1). The DEIS states that during the dam removal construction period "closures of Olympic Hot Springs Road would create the greatest impact." James River believes that the in-river construction and sediment bedload released over 5 to 10 years would create a much larger impact on recreation resources than closing Hot Springs Road during dam removal.

The Revised DEIS must incorporate a corrected analysis of the fisheries impacts, including an analysis of the harvest distribution and its recreation effects. This analysis must include the terminal harvest moratorium that will be required to protect in-river stocks during decommissioning and restoration.

JR-183: Sections 4.2.6 and 4.2.6.2 have been revised to include the potential in-river fishery restrictions during the restoration process.

2. Recreation and Aesthetic Comments

COMMENT AES-1 Olympic National Forest's Management Plan

JR-184

Reference: Sec. 3.8.1, page 3-87, 3rd para, "Because of the ..."

Olympic National Forest Management Plans designate lands approaching the Elwha Valley and along Highway 101 approaching Crescent Lake for retention to maintain aesthetic values adjacent to the park.

COMMENT AES-2 Correct Direction, Southwest

JR-185

Reference: Sec 3.8.1, page 3-87, 2nd para, "Olympic National Park..."

Revised DEIS should be corrected to say "southwest to the upper Elwha Valley."

COMMENT AES-3 Elwha, Lake Aldwell Shoreline

JR-186

Reference: Sec. 3.8.2, page 3-88, "Elwha Project"

The DEIS states that the Lake Aldwell shoreline is not managed for aesthetic consideration but fails to note that the Applicant's management of these lands has resulted in high aesthetic values. The Applicant's management of Elwha Project lands has resulted in shoreline of Lake Aldwell being undeveloped and surrounded by mature, native vegetation. The aesthetic character of Lake Aldwell is high with respect to proximate and distant views. Intermediate views include areas of recent timber harvest. The County Shoreline Master Plan recognizes the condition by designating the shoreline "Natural." The Revised DEIS should identify the benefits of the Applicant's management of these lands.

COMMENT AES-4 Elwha, View Points

JR-187

Reference: Page 3-93, Figure 3-18.

The DEIS identifies key view areas. The Revised DEIS should correct the list by adding Elwha Dam, WDOT View Point at Elwha Canyon off Highway 112, and the Public Boat Launch Area; and by removing Elwha Bridge on Highway 101 and the Indian Creek Campground.

JR-184: The paragraph mentioned in Section 3.8.1 describes the relative visual effect of the Olympic National Park in relation to surrounding lands.

JR-185: Section 3.8.1 has been revised as indicated.

JR-186: While these comments are appropriate, the staff does not have a specific description of the actual management activities promoted by the applicant to specifically protect visual resources on the private lands around Lake Aldwell. The protection offered by the Shorelines Master Program are described in this section.

JR-187: The Elwha dam is not considered a key viewpoint because it is located at the end of an isolated dead-end road. The WDOT viewpoint on Highway ll2 is already listed as the Highway 112 Bridge Crossing. The public boat launch area on Lake Aldwell is also already mentioned as the WDW fishing access/boating area. There is no reference to an "Indian Creek Campground" and the staff believes that the Highway 101 bridge crossing is a key viewing area.

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COMMENTS OF JAMES RIVER II, INC.

JR-188

COMMENT AES-5 Elwha, Lake Aldwell Drawdown

Reference: Sec 3.8.4, page 3-95, 3rd para, "Elwha dam flooded..."

It appears the DEIS confuses Lake Aldwell with Lake Mills in terms of draw-down levels. The DEIS state that Lake Aldwell's "elevation varies about five feet a year." In fact, the surface elevation of Lake Aldwell varies less than ± 3 inches during the year.

JR-189

COMMENT AES-6 Elwha, "Galvanized Penstocks"

Reference: Sec 3.8.4, page 3-95, 2nd para, "The weathered concrete..."

The DEIS discusses "galvanized penstocks." The Revised DEIS should correct this error and state that the penstocks are not galvanized but are painted with "aluminum colored paint."

JR-190

COMMENT AES-7 Elwha, Correct Captions

Reference: Page 3-96, Figure 3-2.0.

The DEIS is in error in the captions on Figure 3-20. The Revised DEIS should be corrected to read: Upper left - from county road. Upper right - from county road. Lower left - view southwest.

JR-191

COMMENT AES-8 Glines, Lake Mills Drawdown

Reference: Sec 3.8.4, page 3-97, 3rd para, "Lake Mills is..."

The DEIS states "under current operating modes, the pool elevation varies little." In fact, at the request of Fisheries Agencies in 1987, 1988, 1989, 1990, the Applicant drafted Lake Mills between 10 and 20 feet each September to provide supplementary flows. Outside of this activity, lake elevation varies 3-5 feet during the rest of the year.

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JR-188: Reference to the 5-foot drawdown has been removed from Section 3.8.4.

JR-189: Section 3.8.4 has been changed to indicate that the metal features are either galvanized or painted in light colors.

JR-190: Figure 3-20 has been revised as indicated.

JR-191: Section 3.8.4 has been revised to reflect these drawdown events.

L. SOCIOECONOMICS, CULTURAL AND HISTORIC RESOURCES

1. Socioeconomic Discussion

JR-192

The DEIS thoroughly evaluates the negative impacts associated with James River's proposal for dam retention including the possibility of an unsuccessful attempt at fish restoration. However, this same thoroughness is not carried over into the assessment of dam removal. The DEIS states that during the construction period for the removal of both dams, the existing commercial, sport and tribal fishery would experience "minimal effects" and that "the higher sediment load in the river during dam removal would have short-term minor adverse effects on sport fishing" in the river. James River believes the DEIS conclusion, of "minimal effects" and "short-term minor adverse effects" are in error. The DEIS identifies risks to existing stocks. For example: a period of 7 to 9 years is reported for increased sediments (DEIS page 4-94); the WDF rearing channel could be unusable during the 5 year construction period and 2 years thereafter because of sediments (DEIS page 4-95); and, fish passage would be impeded during the 5 year construction period, delaying fish restoration for at least 5 years (DEIS page 4-93). The socioeconomics section needs to be consistent with other sections and determine a period during which terminal tribal, non-tribal commercial and sport fishing would have to be eliminated to protect existing stocks. If this period is 12 years, as suggested in an analysis by NRC (Appendix 2 of these comments), then the DEIS most likely is in error when concluding that socioeconomic impacts would be "minimal" and "have short-term minor adverse effects." The long term loss of a terminal coho fishery can be expected to have serious repercussions upon the Lower Elwha Tribe.

The DEIS concludes that dam removal "offers the greatest economic benefit to commercial, sport and tribal fisheries and the greatest opportunity for improvement in tribal social conditions." This conclusion would not be supported by a corrected fisheries analysis. The long term increase in chinook harvest will compensate in part for the permanent loss of the tribal coho fishery which fisheries managers may require, but as determined by NRC, there is no net economic benefit for the dam removal alternative over the current conditions.

A quantitative economic analysis has been performed by NRC on the benefits to the Elwha fishery (Appendix 2 of this document). NRC concludes that over a 50 year study period the net present value of the chinook, coho and steelhead fishery is $13 million with dam retention and $14 million with dam removal, both of which are a reduction from the $19 million value of the existing fishery (NRC Table 19). The annual value of the existing fishery is $746,053; for dam retention $507,561; and for dam removal $893,804. However, for dam removal there would need to be a moratorium on terminal harvest during the period of removal and restoration. NRC estimates a moratorium for 12 years. Thus despite a doubling of the chinook harvest under dam removal, because of the 12 year lag between dam removal and the resumption of harvests the chinook benefits are only marginally above dam retention. This

JR-192: The socioeconomics sections (4.1.8.2, 4.2.8.2, 4.3.8.2, and 4.4.8.2) have been revised to include the long recovery period during which terminal harvests would be reduced or eliminated, and the text has been clarified to distinguish between deferred gains and short- to long-term losses.

The costs of maintaining the quality of the water supply have been revised upward (Appendix A, Table A-27), but staff does not agree that the costs would be as high as those cited in this comment and others. These costs have been added to the dam removal alternative as part of the mitigation package.

Impacts to county tax revenues have been revised to match those provided in this comment.

marginal increase in the value of a restored fishery with dam removal contrasts sharply with the great economic benefits stated in the DEIS. NRC further concludes that dam removal will result in the elimination of the Tribal coho fishery and a reduction in sport and tribal steelhead harvest when compared with present conditions. NRC states that "...since the tribal catch of coho must be reduced or eliminated...it is clear that Indian fishermen face a severe loss of current and future income during the recovery period (12 years) in order to realize long-deferred gains in chinook catches." These lost incomes must be included in the socioeconomic analysis of a Revised DEIS before a fair conclusion can be reached regarding the potential benefits of dam removal.

JR-192 cont'd

The DEIS only briefly mentions the impacts on the City of Port Angeles and industrial users from increased sediment load during the 5 year construction period for dam removal. No quantification of costs is provided in this section or in Table A-24 but costs are provided in the water quality section which state City's O&M costs of $30,000 per year with a capital cost of $100,000; Industrial users (ITT Rayonier & Daishowa) would have O&M costs of $1,097,000 (DEIS page 4-92). The City of Port Angeles and industrial users have recently estimated that water treatment costs from dam removal would be $35,700,000 per year with an O&M cost of $2,762,000. (See comments submitted by the City and by Daishowa America.) The costs in the Revised DEIS need to be corrected.

The DEIS does not correctly determine the impact upon county revenues for each of the alternatives, which would be:

	Current	Dam Retention	Dam Removal
Annual Property Tax	$257,000	$457,000	$0

A thorough economic analysis of the cost impacts of the alternatives would show that the potential local benefits from fish restoration after dam removal would be overshadowed by other costs and the loss of taxes to the County. The Tribal fishery lost during a 12 year moratorium would cause severe problems. The Revised DEIS should include all economic costs and social costs to the County and Lower Elwha Tribe.

2. Socioeconomic Comments

JR-193

COMMENT SOC-1 Lower Elwha Tribal Land Purchase

Reference: Sec 3.9.2, page 3-102, 1st para.

The DEIS states that the Tribal lands were "set aside" in 1936. The Revised DEIS should state that the Lower Elwha Tribal lands were purchased in 1936.

JR-194

COMMENT SOC-2 Sudden Releases of Water - 1

Reference: Sec 3.9.2, page 3-103, last para, "The in-river ..."

The DEIS states that the in-river fishery is "upset by sudden releases of water." The Revised DEIS should state that rapid changes in flow are the result of natural rain fall events in the watershed.

JR-195

COMMENT SOC-3 Applicant's Support of WDF Channel - 1

Reference: Sec 3.9.3.1, page 3-105.

The DEIS does not mention the Applicant's contribution to construction of, and continuing support of the WDF Rearing Channel. The Revised DEIS should report the Applicant's contribution in excess of $100,000 each year.

JR-196

COMMENT SOC-4 Property Taxes

Reference: Sec 4.1.8, page 4-63.

The DEIS states that the Applicant's proposal would not appreciably affect tax revenues. In fact, property taxes would almost double - an annual increase of approximately $200,000 on $14-$15 million in capital construction related to mitigation measures. The Revised DEIS should correctly state the effect on the county revenues.

JR-197

COMMENT SOC-5 Applicant's Support of WDF Channel - 2

Reference: Sec 4.1.8, page 4-65.

See Comment SOC-4.

JR-193: The text has been changed in Section 3.9.2.

JR-194: Section 3.9.2 has been revised as suggested.

JR-195: This point has been added to Section 3.9.3.1.

JR-196: This revision has been made to Section 4.1.8.

JR-197: Comment noted. See response JR-195.

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COMMENTS OF JAMES RIVER II, INC

COMMENT SOC-6 Property Taxes

JR-198

Reference: Sec 5.2.8, page 5-13, 2nd para, "The applicant's proposal..."

The DEIS does not correctly assess taxes paid to Clallam County under dam retention. the Revised DEIS should note that taxes would increase by approximately $200,000 per year following construction of mitigation measures.

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JR-198: Section 5.2.8 has been shortened to focus on major impacts and no longer discusses tax payments.

3. Historic Resources Discussion

Under the license conditioning authority of section 10 of the FPA, FERC must give consideration to, inter alia, plans for protecting cultural resources. 16 U.S.C. § 803(a)(2)(B). Pursuant to the National Historic Preservation Act ("NHPA"), FERC has an affirmative duty to protect structures that are listed on the National Register of Historic Places. 16 U.S.C. § 470-1.

The NHPA requires all federal agencies to provide leadership in the preservation of historic structures and contribute positively to the preservation of cultural resources. Id. at § 470-1(1),(4). FERC's affirmative duty to protect historic structures under the NHPA is similar to its duties under other preservation statutes. The NHPA also confers procedural duties on FERC. 16 U.S.C. § 470f; 36 C.F.R. pt. 800. Finally, NEPA requires FERC to assess the historic and cultural effects of its actions. 40 C.F.R. §§ 1502.16, 1508.8. The DEIS discussion of the historical significance of the Elwha and Glines Canyon Projects, both of which are included on the National Register of Historic Places, is insufficient to fulfill any of these responsibilities. Consequently, the DEIS is insufficient for purposes of making a dam removal decision that would destroy these Projects.

JR-199 The DEIS gives virtually no consideration to the historical and cultural values that the Projects represent. The DEIS does little more than make note of the fact that both Projects are on the National Register of Historic Places. DEIS at 3-110, 4-71, 4-137, 4-164, 4-191, 5-14. There is almost no discussion of the characteristics of the Projects that merit this protection or the values that will be lost if they are destroyed. Consideration of this issue is limited to three sentences on page 3-110. As a result of this insufficient discussion, FERC cannot give adequate consideration to the impacts of dam removal under the FPA, NHPA or NEPA.

Until these historic values of the projects are identified, analyzed, considered, and balanced against any factors that weigh in favor of dam removal, FERC will not have discharged its statutory obligations.

The DEIS fails to give protection of the values represented by these Projects equal weight with other resource protection goals. There is no legal basis for elevating the restoration of natural conditions in the ONP, which is based on NPS policy, above the statutorily protected historic values of these two Projects, and the FERC decision making process must be readjusted to give equal and balanced consideration to historic preservation objectives. As NPS states in its RMP, the cultural resources of the ONP "are to be preserved unimpaired for the enjoyment of future generations." RMP, at 2:8. FERC should recognize its obligation to fulfill this mandate by including the protection of the historic value of these Projects in its public interest balancing review.

JR-199: We feel that the discussion of the dams' significance on page 3-110 is sufficient to convey the cultural and historic values that the dams represent. The DEIS clearly identifies the loss of either dam as an adverse impact, and identifies measures, arrived at in consultation with the SHPO, that would mitigate the loss.

4. Cultural and Historic Resources Comments

COMMENT CUL-1

JR-200 Reference: Sec 3.10.3, page 3-111, 3rd para, "The Klallam who..."

See SOC-2.

COMMENT CUL-2 National Historic Register Status

Reference: Sec 4.1.9, page 4-71.

JR-201 The DEIS states that dam retention "adversely affects the Elwha and Glines Canyon Dams." While mitigation measures would be added to the dams, which are listed on the National Register of Historic Places, they would not affect the status of the dams on the Register. The Revised DEIS should correct the statement to clarify that neither the status of the dams nor the dams themselves would be substantially altered by dam retention.

JR-200: Because there is no flow gage above the Glines Canyon dam, it is not possible to determine to what extent flow fluctuations are due to dam operations or to changes in rainfall. The ramping rates suggested under the applicant's proposal would reduce flow fluctuation problems due to project operation. Rapid fluctuations due to natural causes, however, will not change.

JR-201: The applicant's proposal would add facilities, including fish ladders and holding and shorting pools at the dams. It is possible that these facilities would significantly alter the qualities of the dams that have led to their listing on the National Register; in other words, that they would have an adverse effect on the dams. The determination of project effects on National Register properties must be made in consultation with the State Historic Preservation Officer, according to Section 106 of the National Preservation Act and implementing regulations at 36 CFR 800. It is possible that the added facilities would cause the dams to be removed from the National Register.

M. COSTS

The DEIS addresses costs in a number of summary tables (DEIS Tables 2-5, 2-7, 2-12) and provides detailed cost breakdowns in additional tables (DEIS Tables A-23 and A-24).

The DEIS in its discussion (page 2-29) of total project cost identifies three elements: (a) dollar cost of construction (or removal), (b) incremental increases or decreases in O&M costs and (c) the value of power generation foregone. While the Applicant questions many of the costs, nevertheless the approach is appropriate. The task for the Revised DEIS is to determine
JR-202 all of the appropriate costs and to provide a continuous record of its analysis.

The DEIS's cost analysis of the Applicant's proposal was reasonable and included the Applicant's detailed proposal. As described in Section H. 4, James River questions whether certain of the FERC staff-recommended mitigation measures are reasonable or appropriate. For the purpose of comparing alternatives, however, the cost of FERC staff-recommended modifications should be included in Table A-23. Comparably, the Revised DEIS should also include the costs of all the elements of the Dam Removal Alternative (Table A-24). Among items that may require revision are:

1. Direct Construction Cost for Decommissioning

As discussed in Section F, the decommissioning scheme proposed by FERC staff needs
JR-203 further development before it can be evaluated in detail. To correct the problems identified by the Applicant's analysis or to propose an alternate scheme will result in higher costs. The actions that would be required to make the proposed scheme work could be expected to be beyond the sums that could be covered by contingency allowances. The Applicant has not prepared a cost estimate for FERC's scheme.

2. Water Supply

The DEIS did not include water treatment costs in its summary of Dam Removal Costs (Table A-24), though in the text (pages 4-91 and 4-92) it assumes that some improvements and
JR-204 an increase in O&M costs are necessary to protect municipal and industrial water supplies. The City of Port Angeles and the industrial users have prepared conceptual level studies of the measures needed to maintain existing water supplies. Their combined cost estimates are:

	FERC's DEIS Estimate	City of Port Angeles	ITT Rayonier & Daishowa
Capital	$100,000	$11,200,000	$24,500,000
O&M	$1,127,000	$362,000	$2,400,000

JR-202: Additional cost detail has been provided in Appendix A. The cost of staff-recommended measures has been included in the applicant's proposal with supplemental measures. All cost elements of the dam removal alternative have been included.

JR-203: See revised cost estimate in Appendix A.

JR-204: As an alternative to the method described in the DEIS as well as the commentor's method, the FEIS adopts the use of Ranney well collectors as an element of the dam removal alternatives (Section 4.2.2.3). The cost is summarized in Appendix A, Table A-27.

COMMENTS OF JAMES RIVER II, INC.

3. Fisheries Mitigation

JR-205 The DEIS provides no specific mitigation plan for the Dam Removal Alternative. Fisheries mitigation for the Dam Removal Alternative may require an adult trap in the lower river, off-channel holding facilities for adults, a new hatchery, and a new water supply. These would add substantial costs. The Applicant has not estimated these costs.

4. Terrestrial Mitigation

JR-206 The DEIS provides no terrestrial mitigation plan and repeats the Applicant's cost estimate. The DEIS incorporates the Elwha Project lands in its mitigation "plan" at no cost and in conflict with the analysis in the Land Use Section which determines that Elwha Project lands would return to private uses. The Revised DEIS should identify the cost of land and timber acquisition if Elwha Project lands are to be part of a mitigation plan.

5. Miscellaneous Civil Works

JR-207 The DEIS identifies that raising the levee at the Lower Elwha Reservation (page 4-84) will be required for the Dam Removal Alternative but does not include its cost ($570,000) in Table A-24. The DEIS mentions other items without providing a cost estimate, for example additional recreation facilities. The requirements to protect existing civil works, for example bridge foundations, are not addressed. These costs should be included in the Revised DEIS.

6. Cost of Power

JR-208 The DEIS is seriously in error regarding the long-term cost of power to the Daishowa Mill resulting from dam removal. This issue is addressed in Section E, Need for Power.

RESPONSES TO JAMES RIVER II, INC.

JR-205: A plan was developed in Appendix A, Part 3.3.

JR-206: Section 4.0 has been modified to include costs for staff recommended measures for terrestrial resource improvement/enhancement. For the analysis of the effects of dam removal on terrestrial resources, the DEIS includes only the land currently under Lake Aldwell. The land owned by James River that surrounds Lake Aldwell is assumed to be managed for timber production. Section 4.2.5.2 has been changed to reflect the assumption that land currently under Lake Aldwell would be acquired as part of the dam removal alternative and managed as wildlife habitat.

JR-207: The revised tables in Appendix A include all of the costs associated with the dam removal alternative.

JR-208: Refer to response JR-13.

N. DAM REMOVAL LIABILITY

The DEIS alludes to the possibility that dam removal liability could be passed on to James River. See, e.g., DEIS at 5-13, 5-24. No support is provided for this conclusion. In fact, there is no legal basis upon which James River can be required to pay these costs.

As explained in detail in James River's response to the GAO report on this issue, FERC has only three options available at the expiration of a license under section 15(a)(1) of the FPA, 16 U.S.C. 808(a)(1): government takeover; issuance of a new license to the original licensee; issuance of a new license to a new licensee. See James River's Response to GAO Analysis (May 8, 1990) ("GAO Response I") at 44-47. Assuming that federal takeover for removal purposes is an option available at this time, this would be the only mechanism to achieve removal of the Glines Canyon Project. Under this approach, the federal government would have to acquire the Project and then initiate its own action to remove the facility. GAO agrees with this conclusion. See GAO Advisory Analysis of Jurisdiction Issue, at 9 (Feb. 16, 1990); GAO Supplemental Advisory Analysis of Jurisdiction Issue, at 8 (Aug. 16, 1990).

JR-209 FERC also lacks authority to require James River to pay the costs of removal of the Elwha Project. See GAO Response I at 47-56; James River Response to GAO Supplemental Advisory Opinion (Nov. 30, 1990) ("GAO Response II" at 14-16. The Elwha Project was legally constructed prior to passage of the FPA, on private lands on a river that was not considered navigable under then existing law. Upon the determination that FPA licensing jurisdiction applied, a license application was filed, and all associated legal requirements have been met throughout the licensing process. Thus, the Project is in compliance with all applicable legal requirements and cannot be considered a trespass structure. Should FERC deny a license to the Elwha Project, the same principles applicable to the Glines Canyon Project would apply, i.e., if FERC determines that the public interest requires removal of this privately owned structure it would be the federal government's obligation to takeover the project, compensate James River, and pay removal costs. Under these circumstances, there is no basis for requiring James River to remove the Elwha Project. In any event, the strong presumption against requiring the removal of existing Projects at owner expense is demonstrated by the legislative history of the Electric Consumers Protection Act of 1986, where it is stated, "[n]o one expects FERC to require an applicant to tear down an existing project." H.R. Rep. No. 934, 99th Cong., 2d Sess. 22 (1986).

For these reasons, the Revised DEIS should explain that FERC has no authority to require James River to remove either Project.

JR-209: Issues of financial liability are not being addressed within the context of the EIS.

DRAFT STAFF REVIEW

O. FERC JURISDICTION

The DEIS discussion of FERC's jurisdiction to relicense the Glines Canyon Project understates the strength of the legal basis for recognizing such authority. It also provides a misleading and confusing explanation of the procedural posture on this issue. For the reasons set forth in James River's numerous filings with FERC, it is clear, on legal and policy grounds, that the Federal Power Act ("FPA") confers jurisdiction to relicense this Project.

The discussion of licensing jurisdiction in section 1.2.1.2 begins with the equivocal statement that "[r]esearch and analysis conducted by the Commission staff do not provide a definitive answer to the question of the Commission's authority to relicense the Glines Canyon Project." This statement, which appears to have been taken from the August 24, 1989 research paper submitted to Congressman Dingell by the FERC staff, no longer reflects the current view of the Commission or its staff. Since that staff report was prepared, this issue has been the subject of extensive additional research, briefing and review. The result of this additional scrutiny is reflected in the Commission's October 19, 1990 order, in which the members of the Commission unanimously declared that the FPA confers relicensing jurisdiction, and the Commission's April 15, 1991 order denying rehearing. See Order in Response to Petitions for Declaratory Order, 53 FERC ¶ 61,096 (Oct. 19, 1990); Order Denying Requests for Rehearing and Reconsideration, 55 FERC ¶ 61,034 (April 5, 1991).

JR-210 James River will not repeat its arguments on the jurisdiction issue in this comment. All of James River's previous filings on this issue are incorporated in full herein by reference. See Response to Environmental Intervenors' Petition (April 22, 1988); Response to GAO Analysis (May 8, 1990) ("GAO Response I"); Response to Department of the Interior Petition (July 24, 1990); Response to GAO Supplemental Advisory Opinion (Nov. 30, 1990) ("GAO Response II").

We note, however, that the grounds for upholding FERC relicensing jurisdiction are based on far more than "the need to retain regulatory authority over the entire project in a centralized forum," as suggested by the characterization of the October 19, 1990 FERC order contained in the DEIS. DEIS, at 1-3. This misleading characterization was categorically rejected by the Commission in its April 15, 1991 order denying rehearing/reconsideration, where it is stated "[a]lthough we noted that our consideration of Glines and Elwha will provide a centralized forum for disposition of the entire unit of development, this was not our basis for finding jurisdiction." 55 FERC at ¶ 61,044 (emphasis added).

Among the legal grounds for FERC's relicensing jurisdiction are the following factors, which should be reflected in the EIS discussions of this issue:

1. Clear legal authority to issue new licenses to validly licensed pre-existing projects is set forth in section 15(a)(1) of the FPA, 16 U.S.C. § 808(a)(1);
2. The limitations on issuing licenses for projects located within units of the National Park System (16 U.S.C. §§ 796(2), 797(c)), apply only to new projects, not to pre-existing projects licensed before the establishment of the park;

JR-210: The referenced section has been modified to reflect current FERC legal opinion on jurisdiction.

JR-210 cont'd

3. A long line of NPS precedent confirms the right of the project owner to continue to operate the Project.
4. James River's right to seek a new license is confirmed by 16 U.S.C. § 255, which protects valid existing rights at the time the Park was established.
5. Denying James River the opportunity to seek a new license would constitute a taking under the fifth amendment requiring compensation for the lost value of the Project.

Although the DEIS addresses the jurisdiction issue, there are no grounds upon which the Commission can reverse its October 19, 1990 and April 15, 1991 orders. In light of the FERC orders and the additional grounds for relicensing discussed by James River in its submissions to FERC, the discussion in the FEIS of the jurisdiction issue should be revised to confirm the strong legal and policy grounds for FERC's authority to consider the Glines Canyon Project license application.

APPENDIX 1
GLINES PROJECT FERC NO. 588
LAKE MILLS ELEVATION DURING DAM REMOVAL
COMMENTS ON
FERC DEIS DATED FEBRUARY 1991

JR-211

1. REMOVAL SCHEME

The scheme for removal of the Glines project is that discussed in the DEIS, Table 4-15, Construction Sequence Summary, page 4-75. Information in the DEIS in Appendix A, Section 3.2, pages A-53 to A-61 is also used to establish drawdown, schedule, and outlet criteria.

A. Schedule

The schedule for removal of the Glines project is presented in the DEIS, Appendix A, page A-54. Drawdown would begin in April of schedule year 2. Stabilization of sediments would be done in year 2, 3, and 4, with removal of the dam structure in year 5.

JR-212

B. Drawdown Criteria

1. Schedule Year Two

Drawdown would begin April of this year, with the reservoir lowered from El. 610 to El. 510 with use of the spillway, power conduit, and the new diversion tunnel. The reservoir would remain at El. 510 this year. Rate of drawdown is controlled at 1 foot per day. Seeding and erosion control would be done to El. 510.

2. Schedule Year Three.

Drawdown would lower the reservoir to El. 460 this year. Drawdown is controlled at 1 foot per day. Seeding and erosion control would be done to El. 460.

JR-211: The construction sequence summary and schedule have been revised in accordance with Figures A-29 and A-32.

JR-212: Under the revised plan, drawdown of the reservoir would be accomplished over a two year period instead of the three presented in the DEIS. See response JR-211 for the revised drawdown schedule.

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JR-212 cont'd

3. Schedule Year Four.

Drawdown would lower the reservoir to El. 430 (empty) this year. Drawdown is controlled at 0.3 foot per day to assure that constructed slopes are stable and would not slide into the river channel. Seeding and erosion control would be done to El. 430.

4. Schedule Year Five.

Removal of the dam structure would be done this year, with the reservoir remaining at minimum elevation to allow the work to be done in an unwatered condition.

JR-213

C. Outlet Facilities

1. Dam Crest

This study uses the dam overflow crest as an uncontrolled weir spillway if the reservoir elevation is above 610. Flow is based on an equation for broad crested weirs.

2. Spillway

This study uses the dam spillway as an uncontrolled weir spillway if the reservoir elevation is above 590. Flow is based on an equation for broad crested weirs. No gate control is used.

3. Power Conduit

The DEIS states that flows of 6000 cfs (page A-53) through the power conduit are possible if the turbine runner is removed. This flow produces flow velocities in excess of 75 feet/second. This velocity is impractical and would simply destroy the existing conduit. No provisions for energy dissipation structures at the outlet were discussed, so it is apparent that the cost implications of extensive energy dissipation structures or modifications to the conduit were not considered either.

Even with extensive modifications to the conduit, these excessive velocities are not feasible. Engineering practice dictates that a maximum flow velocity of 30 feet/second must not be exceeded to limit downstream damage and assure that the conduit does not suffer a catastrophic failure.

JR-213: Staff concurs that the flow velocities in the power conduit should be restricted pending a full understanding of the integrity of the power tunnel and penstock. Under the refined diversion scheme, flow through the power tunnel would be restricted to 2,400 cfs.

COMMENTS OF JAMES RIVER II, INC.

JR-213 cont'd

For the purposes of this study the outlet flow capabilities of the conduit were limited to a maximum of 2850 cfs to a maximum reservoir elevation of 590. Flow is controlled by the intake gate or the wicket gates at this level. No flow through the conduit was allowed below reservoir elevation 533 (top of the conduit) to preclude air entrapment at the intake. No flow equation was used, the discharge is constant at 2850 cfs.

4. Diversion Tunnel

The DEIS defines the flow in the new diversion tunnel to be 3500 cfs at the crown of the tunnel, elevation 445. At a reservoir above this, using a maximum flow velocity of 30 feet/second, 3390 cfs can be discharged. This higher discharge value was used for the diversion tunnel. No flow equation was used, the discharge is constant at 3390 cfs.

D. Reservoir Storage

JR-214

Reservoir storage data was based on the bathymetric map dated February, 1990. A value of 0 storage at elevation 430 was added as a limiting point. Storage above elevation 594.87 was based on the Peninsula College data. A storage of 34990 acre-feet was used at elevation 620, again as a limiting case. This upper limit was derived by a straight line extension of the previous data.

E. Other Controls

JR-215

The maximum drawdown rates as outlined previously were used to control maximum discharge of all outlets. No consideration for downstream peak flows or ramping rates was included in the model.

RESPONSES TO JAMES RIVER II, INC.

JR-214: Comment noted.

JR-215: Comment noted.

DRAFT STAFF REPORT

II. INFLOW HYDROGRAPHS

A. Data Base

JR-216 Flow data from the USGS for the Elwha River at MacDonald bridge was used for the study calculations. Data from 1919 to 1927, and from 1970 through 1988 was used. The data previous to 1927 represents inflow at the Glines site before construction of the dam. The subsequent data before 1982 is influenced by the operation of the Glines project. Subsequent to 1982, other studies indicated that Glines was operated as a "run of the river" plant, so the flows are more representative of actual inflow at Glines.

B. Data Selection

JR-217 All the data mentioned above was used to establish three blocks of consecutive data conforming to the removal schedule. Beginning in 1919, successive blocks of data beginning April first and ending December 31 three years later were developed. This conforms to the removal schedule as stated above. 22 blocks of data were thus available. A frequency analysis based on total outflow volume for each block was performed. From this three blocks of data were selected to represent exceedence levels of 15%, 50% and 85%. For example, the data block from April 1, 1924 through December 31, 1927, has an exceedence level of 85%(would be exceeded 85% of the time) and was selected as the minimum flow condition. Similar procedures yield the data block from April 1, 1970 through 1973, to be the 50% exceedence level, and 1973 through 1976 to be the 15% exceedence level.

C. Flow Model

JR-218 A computer model to calculate reservoir elevation was created to process the above three selected data blocks. Results are plotted on the attached graphs.

JR-216: Comment noted.

JR-217: Comment noted.

JR-218: Comment noted.

III. DISCUSSION OF RESULTS

A. General

JR-219 This discussion will consider the minimum flow data block as shown on graph 1 attached. This graph represents the exceedence probability of 85%. In other words, the volume of the flows shown will be exceeded 85% of the time. The recurrence interval for these events is slightly over one year.

B. Schedule Year Two

JR-220 The graph indicates that the reservoir would be successfully drawn down to elevation 510 by September 20. The reservoir remains at El. 510 until October 20. One small flood disrupts work in late September and only for one day. It is noted that flooding up to El. 535 occurs after Oct. 20 and continues into the following year. Erosion control work and vegetation below 535 would be inundated for 75 days at the end of year 2. A construction season almost as long as indicated in the DEIS page A-32 is available this year.

C. Schedule Year Three

JR-221 Year three plan is to draw the reservoir to El. 460 and continue with the sediment stabilization to that elevation. The plot shows that the reservoir is not drawn to El. 460 until April 20. Then in one month the reservoir rises again to almost El 510. Construction work is prevented below about El. 510 until July 15. The reservoir remains dewatered to El. 460 until December 10, when it again fills to El. 510. The construction season is only 5 months this year as apposed to the DEIS schedule of 8 months. In addition, vegetation and erosion control measures installed below El. 510 this year are again inundated for 75 days at the end of this year and the start of year 4.

JR-219: The comment and analysis are acknowledged, and under the criteria and restrictions stipulated by the commentor, the subsequent results appear reasonable. As described in response JR-5, the staff has modified its river diversion plan to include incremental lowering of the Glines Canyon dam to coincide with the drafting of the reservoir. Under this refined plan, inundation of the sediment stabilization activities would be essentially eliminated.

JR-220: See response JR-219.

JR-221: See response JR-219.

D. Schedule Year Four

JR-222 The schedule indicates that the reservoir is to be dewatered to El 430 this season. The graph indicates that the reservoir cannot be draw down to El 430 until June 1 of year four. Early this year the reservoir filled to El. 510, inundating all of the work performed in year three. The construction season in year four at El 430 is limited to 4 1/2 months due to flooding in mid October as well as the late start. The winter of year four and five floods the reservoir clear back up to El. 535. Much of the work done in the previous seasons is inundated for over 100 days this winter, and would most certainly have to replaced.

E. Schedule Year Five

JR-223 Year five prevents any work at El 430 as this level is never achieved. Work scheduled is to remove the dam and structures, but the reservoir elevation will require this work to be done "in the wet". Recovery of debris from removal of the structure from the river channel is impossible. Inundation occurs again in June up to El. 535. Work below El. 460 is inundated for 80 days. The channel erosion will obviously cause much rework of sediment stabilization structures to be done. No vegetation below El 460 is likely to survive as the reservoir is below El 460 only 140 days all year. It is obvious that construction cannot be complete as the DEIS schedule indicates. The extended duration is completely unknown, as the work is at the mercy of the river.

F. Other Studies

JR-224 The graphs also show the reservoir elevations for a 50% exceedence (equivalent to every two years) flow volume hydrograph. As would be inferred, the situation is much worse. Actually no work below El. 460 can be accomplished at all during this 4 year schedule period.

The graph of the 15% exceedence level is provided to show the contrast between the various hydrographs used and reservoir elevations. The 15% level graph indicates that almost no work at all can be accomplished as planned, if the actual flows resemble this volume and frequency.

JR-222: See response JR-219.

JR-223: See response JR-219.

JR-224: See response JR-219.

IV. CONCLUSIONS

JR-225 The scheme of removal of the Glines Canyon project with the sediment control plan as outlined is impractical. It cannot be performed with the constraints of river flow, outlet capabilities, and drawdown criteria established in the DEIS. More rapid draw down rates would improve the reservoir level situation but the terrace slopes would not be stable. Large slides would develop injecting sediment into the river. It is interesting to note that slope stability studies conducted for the DEIS indicate that terrace slopes are not stable if the materials are wet. This study indicates that even if the reservoir can be lowered to allow construction of the terraces, frequent inundation will occur causing slope instability and destruction of previous work. Erosion control measures, such as plantings, will not survive.

It is apparent that further evaluation of the DEIS with respect to dam removal is not practical. Evaluation of a plan that is unworkable is not productive. The DEIS must be modified to reflect the conditions of the site and the river flows that may occur. A revised plan must be presented that will be possible to construct. Cost estimates must include the real world impacts of the revised plan.

JR-225: See response JR-219.

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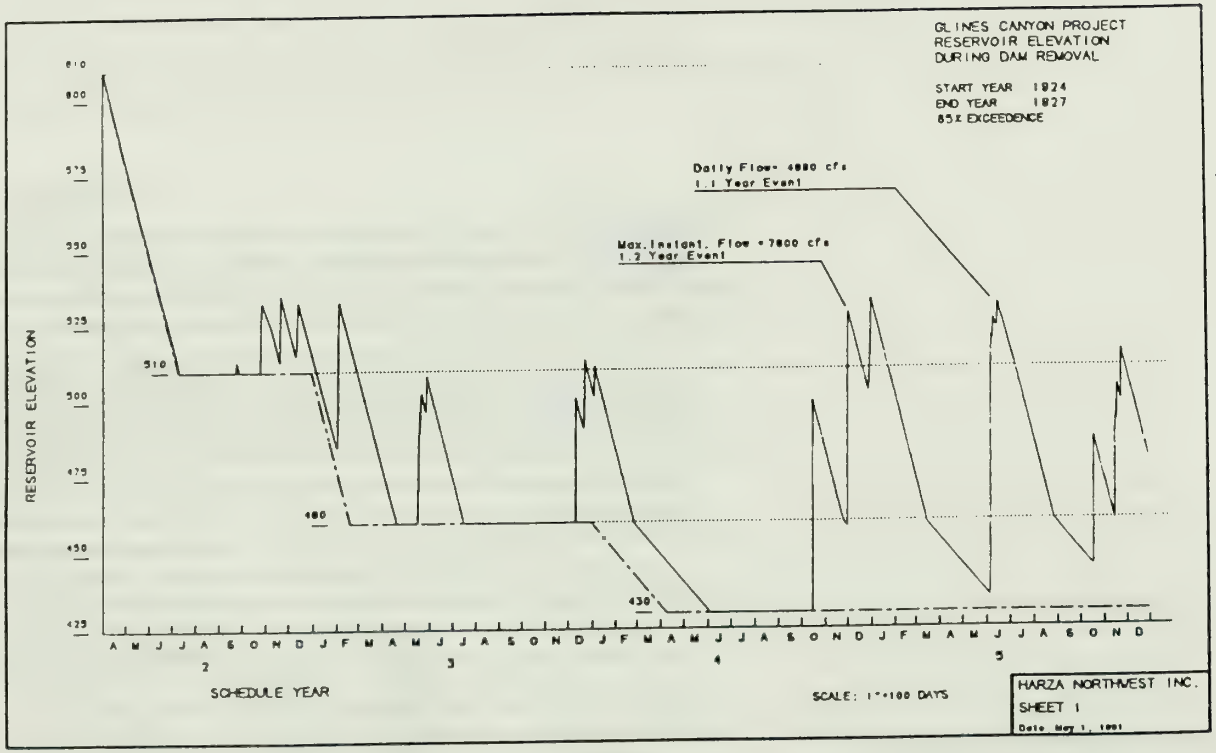
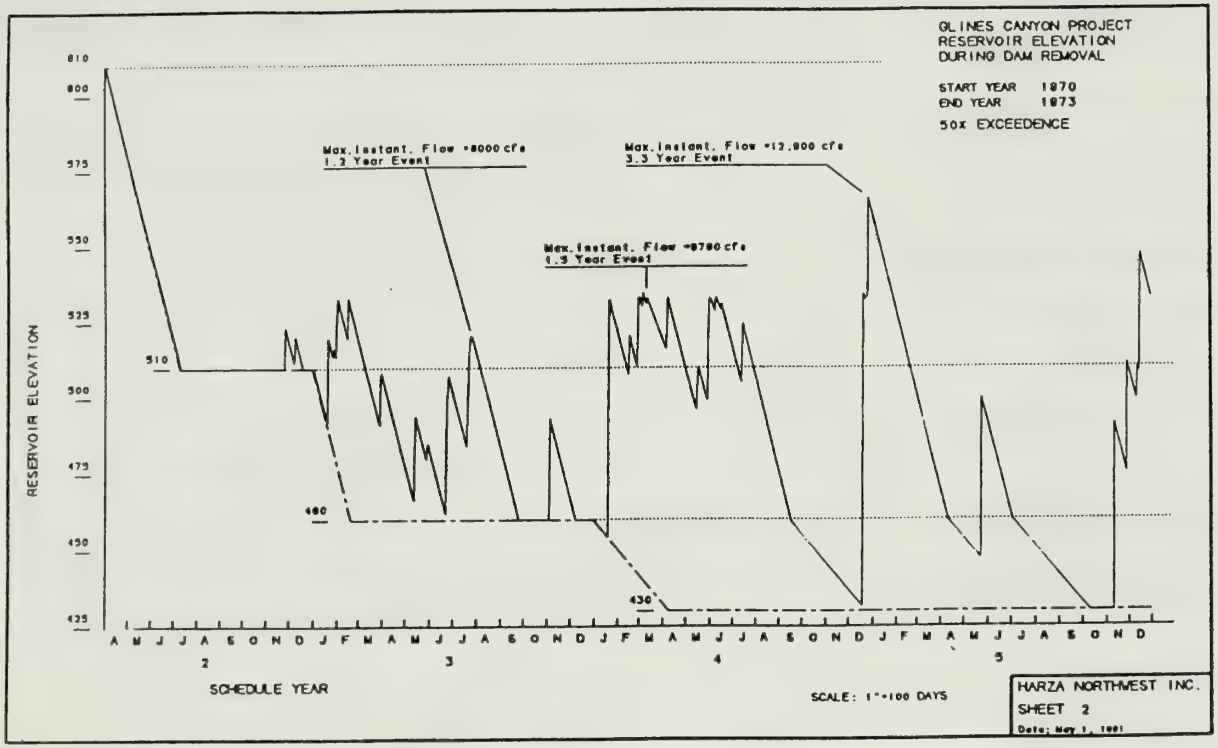
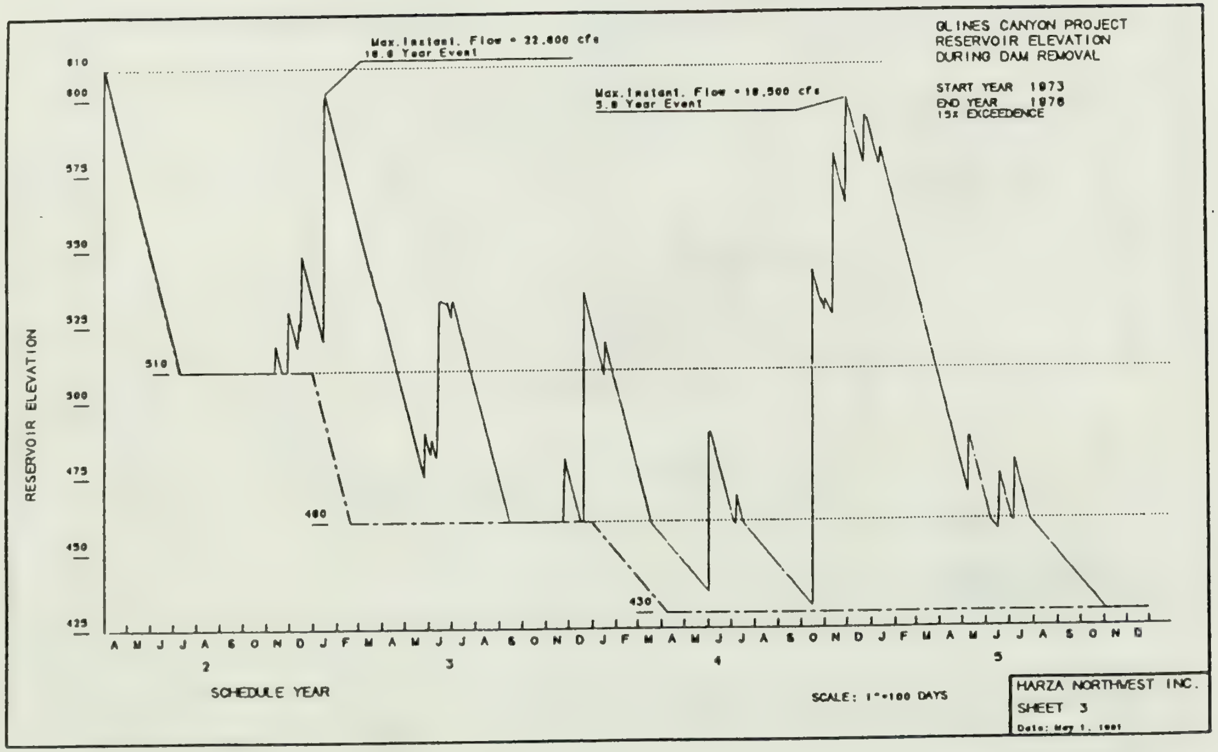

GLINES CANYON PROJECT
RESERVOIR ELEVATION
DURING DAM REMOVAL
START YEAR 1924
END YEAR 1927
85% EXCEEDENCE
Daily Flow= 4800 cfs
1.1 Year Event
Max. Instant. Flow = 7800 cfs
1.2 Year Event
RESERVOIR ELEVATION
SCHEDULE YEAR
SCALE: 1"=100 DAYS
HARZA NORTHWEST INC.
SHEET 1


GLINES CANYON PROJECT
RESERVOIR ELEVATION
DURING DAM REMOVAL
START YEAR 1970
END YEAR 1973
50% EXCEEDENCE
Max. Instant. Flow =8000 cfs
1.2 Year Event
Max. Instant. Flow =12,900 cfs
3.3 Year Event
Max. Instant. Flow =9780 cfs
1.5 Year Event
RESERVOIR ELEVATION
610
600
575
550
525
500
475
450
425
510
460
430
A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
2
3
4
5
SCHEDULE YEAR
SCALE: 1"=100 DAYS
HARZA NORTHWEST INC.
SHEET 2
Date: May 1, 1991


GLINES CANYON PROJECT
RESERVOIR ELEVATION
DURING DAM REMOVAL
START YEAR 1973
END YEAR 1978
15% EXCEEDENCE
RESERVOIR ELEVATION
SCHEDULE YEAR
SCALE: 1"=100 DAYS
HARZA NORTHWEST INC.
SHEET 3
510
480
430
2
3
4
5

EXHIBIT

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REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683)
Hydroelectric Projects, Washington

Prepared by:

Natural Resources Consultants, Inc.
and Dr. Gary S. Morishima

Prepared for:

Perkins Coie, Attorneys at Law

June 26, 1991

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EXECUTIVE SUMMARY

In a review and evaluation of the Draft Environmental Impact Statement (DEIS) and associated materials concerned with the Glines Canyon and Elwha hydroelectric projects, NRC concluded that the current DEIS (1) contains mathematical errors, (2) incorrectly applies juvenile and adult dam and lake passage mortalities to salmon and steelhead runs, (3) misapplies population dynamics theory to given stock parameters, and (4) incorporates a number of inconsistencies. These shortcomings lead to an exaggerated and/or over-optimistic view of the magnitude of benefits that might be derived form the various options. Further, the DEIS overestimates dam and reservoir mortalities for chinook, coho, and steelhead for the dams-in scenario.

Those assessing restoration potential should weigh carefully the capacity of appropriate management agencies to adequately control the harvests of these species and the availability of stocks for restoration. Past experience with the capacity of fisheries agencies to meet such objectives is not encouraging. Given that a stated goal of the DEIS is to restore self-sustaining runs of wild anadramous salmon, poor assessments of stock availability could render moot favorable evaluations of habitat, sustainable exploitation rate (SER), and passage mortality.

The application of passage mortality on a stream-reach basis reduces total passage mortality and thus improves the restoration potential for chinook, coho, and steelhead compared to assessments made in the DEIS. Restoration feasibility is judged to be most favorable for chinook and steelhead. The expected difficulty of maintaining sustainable exploitation rates at levels necessary to restore coho reduces the feasibility of coho restoration. Stock availability concerns lead NRC to believe that the restoration potential for pink and chum salmon is poor, regardless of the river management scenario considered.

The NRC study notes that from the standpoint of the State of Washington, future coho runs are unlikely to contribute to the state if U.S./Canada tradeoffs cannot be achieved. Even for chinook, it must be recognized that the majority of new production is likely to be harvested off British Columbia and Alaska.

Short-term environmental degradation in the Elwha River that is likely to occur following dam removal could threaten the existence of indigenous hatchery/wild stocks if arrangements with Canada to protect these runs cannot be agreed upon within the U.S. Canada Salmon Commission and if current enhancement facilities are abandoned or rendered unusable.

The current DEIS was also found to be lacking in that it does not provide information on the benefits, costs, and impacts that might occur to specific user groups and fails to examine management requirements and mechanisms that may be needed to protect salmon and trout stocks following dam removal and/or dam passage installations.

The report concludes by noting:

> It should be clear from a strict economic accounting of costs versus benefits which might be derived from fishing under the dams-removed and dams-in fish passage proposals, that both alternatives loom as economic nightmares. In both cases, the net present economic value of the harvested fish would decline substantially as compared to existing conditions. The net costs, assuming a 50-year period, for the dam removal option would exceed $250,000,000, while the dams-in with fish passage devices installed would cost around $45,000,000 over the same time period. Thus, dam removal acceptance must rest almost exclusively on the value the public places on returning the river to near-pristine conditions or rebuilding "wild" stocks in the river. From the standpoint of fish production alone, the money would be better spent elsewhere.
>
> Whatever decision is made regarding the future of the Elwha, it should be taken in an enlightened understanding of what we can reasonably expect in terms of future runs, the time required to restore such runs to maximum sustainable yield (MSY), and the associated risks and costs. These factors are not adequately addressed or available in the current DEIS.

ELWHA AND GLINES CANYON DAM
HYDROELECTRIC PROJECT

INTRODUCTION

In early April 1991, Natural Resources Consultants, Inc., was contacted by the Perkins Coie law partnership to review and evaluate information incorporated in a Draft Environmental Impact Statement (DEIS) concerned with the Glines Canyon and Elwha hydroelectric projects, as well as various materials, reports, and comments prepared by James River II, Inc., concerning these projects and the Elwha River. The specific scope of work requested of NRC included:

SCOPE OF WORK

Evaluation of Existing Materials

1. Sweasey Dam Removal

   NRC will gather and summarize existing information on dam removal in the Mad River, California. The sediment-handling plans which were developed will be described with a summary of how well they worked and the reasons for any failures. A summary of the biological impacts of dam removal, the length of recovery periods, and the eventual outcome of the fish restoration effort should also be included.

2. Review of DEIS and James River Documents

   a. Review of Stock Recruitment/Production

      NRC will review stock/recruitment and production information developed both in the DEIS and by Harza (equilibrium run size estimates, Ricker "a" values, optimum exploitation rates, etc.). Gary Morishima or other knowledgeable parties will be contacted as required. The goal is to independently confirm (or modify) the steelhead, coho, and chinook stock/recruitment curves provided to NRC by Harza on April 10, 1991. NRC will also note any additional stock/recruitment or production information for the other species of interest, pink, chum, sea-run cutthroat, and Dolly Varden.

b. Potential for Successful Stock Restoration

NRC will review the DEIS and Harza information related to the potential for successful restoration of all species and stocks, particularly as related to stock availability and achievable exploitation rates. NRC will suggest revisions to the DEIS and Harza analyses, as appropriate.

c. Additional Topics

NRC will note any additional topics on which they could provide technical input, especially qualitative statements made in the DEIS for which quantitative details could be generated.

Generation of New Information

1. Short-term Management Implications

The DEIS states severe "short-term" harvest restrictions will be required during dam removal and for some additional time afterward. The goal is to sustain existing runs during the period the river and hatcheries are being impacted by dam removal. In conjunction with Harza, define the time frame over which these restrictions would occur and estimate:

a. Magnitude of Harvest

The magnitude of the harvest restrictions potentially required (i.e., what are the maximum exploitation rates, if any, the stocks will be able to sustain during the dam removal period). Discuss the feasibility of achieving the necessary rates in light of political and jurisdictional considerations. If the rates cannot be fully achieved, describe the maximum restrictions which could be achieved.

b. Required Management Plan

Based on the magnitude of the restrictions defined under 1.a., outline a reasonable harvest management plan to achieve the required exploitation rates. Identify which sport and commercial fisheries (Indian and non-Indian) would most likely be affected, the magnitude of the restrictions which would have to be placed on each fishery, and the agencies which would be responsible for implementation.

c. Economic Impacts

Calculate the monetary value of the harvest, including gains or losses to mixed-stock fisheries.

2. Long-Term Management Implications

Assuming successful restoration is achieved under either the dam removal or dam retention scenarios, the DEIS states that long-term harvest management will be directed at achieving optimum exploitation rate (OER) harvest on wild, self-sustaining stocks. For both the dam removal and dam retention scenarios, NRC will estimate the following:

a. Magnitude of Harvest

The magnitude of the harvest restrictions required (i.e., what is the OER exploitation rate for each stock). Discuss the feasibility of achieving the necessary rates in light of political and jurisdictional considerations.

b. Required Management Plan

Based on the harvest goals defined under 2.a., outline a reasonable harvest management plan to achieve the required exploitation rates. Identify which sport and commercial fisheries would most likely be affected, and the magnitude of the restrictions which would have to be placed on each fishery.

c. Economic Impacts

Calculate the monetary value of the harvest, including gains or losses to mixed-stock fisheries.

3. Evaluation of Hatchery-Augmented Wild Stock Restoration

James River has identified steelhead, coho, and chinook as target species for restoration and has stated that artificial production of other stocks could provide additional harvest opportunities. In conjunction with Harza, outline a reasonable scenario which would allow self-sustaining runs of the restored stocks to coexist with a hatchery-based harvest program for artificial stocks.

4. Economic Impacts of Present Condition and Two DEIS Wild Stock Restoration Proposals

For a thirty-year license period, using project costs from the DEIS and Harza, prepare a net present worth estimate for harvest under

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three scenarios: existing conditions, dam retention with restoration, and dam removal with restoration.

The following report constitutes NRC's response to the work assignment outlined by Perkins Coie:

SPECIFIC DOCUMENTS EXAMINED

1. Draft Environmental Impact Statement - FERC/EIS-0059D, Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington, Federal Energy Regulatory Commission, Office of Hydropower Licensing, February 1991

2. Joint Fishery Agencies' Comments to Response to FERC request for Additional Information of May 28, 1987 - FERC No. 2683 and FERC No. 588, August 16, 1988

3. Response to Request for Additional Information of May 28, 1987, Volume 3 of 4, Elwha Project, FERC No. 2683, and Glines Project, FERC No. 588, James River, Inc., May 27, 1988, prepared by Hosey and Associates for Perkins Coie

4. Supplemental Response to May 28, 1987, Request for Additional Information, (Response To: Supplemental Joint Fishery Agencies' Comments), Vol. 2 of 32, Appendices, Elwha Project, FERC No. 2683, Glines Project, FERC No. 588, James River II, Inc., December 2, 1988, prepared by Hosey and Associates Engineering Company

5. Response to October 23, 1989, Request for Additional Information, Item 1, 1989 Fish Studies, Elwha Project FERC No. 2683, Glines Project No. 588, James River II, Inc., March 15, 1990, prepared by Hosey and Associates Engineering Company

6. A Discussion of Prospects for Fish Restoration at the Elwha Project, FERC No. 2683, Glines Project, FERC No. 588, James River II, Inc., June 5, 1990, prepared by Hosey and Associates Engineering Company

7. Comments on FERC's February 1991 DEIS , Elwha Project, FERC No. 2683, Glines Canyon Project, FERC No. 588, Filed by James River II, Inc., June 28, 1991, prepared by Harza Northwest, Inc.

8. Methodology for Determining Puget Sound Coho Escapement Goals, Escapement Estimates, 1977 Pre-season Run Size Prediction, and In-Season Run Assessment. Washington Department of Fisheries Technical Report 28, 1977

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9. Northwest Power Planning Council (staff) Technical Planning Report, October 22, 1986

10. Harza Northwest's working papers on production potential for various Elwha salmon species and steelhead (Ricker curves)

11. Special arrangements were also made to evaluate the coded wire tag release and recovery information from the Elwha River.

12. Winter, Brian D., 1990. A Brief Review of Dam Removal Efforts in Washington, Oregon, Idaho and California. NOAA Technical Memo, NMFS F/NWR-28, April 1990.

The documents were read in light of the specific questions addressed to NRC.

NRC STAFF

NRC staff members and subcontractors involved in the review and preparation of this report, and their specific assignments included:

1. Dr. Dayton L. Alverson, President of NRC - organization of work, comments on the technical merits of the DEIS and James River documents, review of production numbers and general methodology in the DEIS, preparation of production numbers

2. Jeffrey A. June, NRC - technical merits of documents and resource management requirements for Elwha stock recovery, review of Sweasey Dam removal

3. Mark H. Freeberg, NRC - calculation and application of downstream and upstream in-river mortalities by species, review of all documents, and restoration potential comments for selected species

4. Douglas W. McNair, NRC - Potential management actions for stock recovery

5. Dr. Gary Morishima - production evaluation and analysis of coded wire tag information from the Elwha River

6. Dr. James A. Crutchfield, NRC - estimation of current and future values of Elwha salmon runs

Biographies of the above scientists are located in Appendix I. The above scientists have examined the identified documents and materials in terms of the methods of analysis, documentation of data sources and numbers

used, application-derived parameters, and the validity and quality of the conclusions presented. In instances where the NRC team felt there were errors in computing parameters or in their application, we have generated alternative parameters or estimates and justified the rationale for their use in exploring the biological and economic implications of fish production under three scenarios: status quo, the proposal to retain dams and build fish passage facilities, and the removal of both dams.

SUMMARY OF SWEASEY DAM REMOVAL ON THE MAD RIVER, CALIFORNIA

A brief summary of the findings of the review of the Sweasey Dam removal is presented here. A more detailed analysis is presented in Appendix II.

Background

Removal of dams on the Elwha River would represent the first destruction and clearing of a dam on the West Coast with the object of ecosystem restoration. Although not removed solely for fish restoration purposes, the removal of Sweasey Dam on the Mad River in northern California offers a comparison of the effects of dam removal on an anadromous salmon and steelhead river. The Mad River offered the only West Coast case study relevant to the Elwha River Proposal. The Mad and Elwha Rivers are similar in fish resources, in that each supports populations of chinook and coho salmon and steelhead trout. Both rivers are also similar in discharge rates.

JR-226 The Sweasey Dam was removed in after 20 years of operation in 1970 because of a build-up of sediments that reduced the storage capacity and presented a safety hazard. Essentially all of the 2.4 million cubic yards of stored sediments were released down stream during the next two years. Immediate resulting impacts were an unstable river course, negative impacts on fish spawning grounds from sedimentation, and a decrease in the depth of the river downstream from the dam site to an extent that reduced up-stream returning adult chinook salmon and caused significant mortalities.

Long-term impacts of the Sweasey Dam removal are difficult to separate from other environmental and man-caused effects. However, potential dam removal-related impacts include a three mile movement in the mouth the Mad River due to a build of fine sediments, continued problems with adult fish passage upstream in the lower river due to a wider, shallower river channel, water temperature related adult mortalities, and continued relative heavy fine sediment load in the lower river. After 20 years, there has been no significant increase in salmonid production above the dam site and overall returns to the Mad River have been highly variable.

Summary of Conclusions

JR-227 The Elwha River DEIS should address the stabilization of sediments within the reservoir in greater detail, since release of these sediments downstream could have catastrophic impacts on fish production.

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JR-226: The Sweasey dam removal is one example of the effects of dam removal, but there are many significant differences from that of the Elwha in terms of predicting effects of the removal.

First, it is not the only example applicable to the Elwha dam removal alternative. The Elwha dam removal alternative considers two major factors: the effects of opening new habitat and effects of sediment on the resources.

There are several examples in the Northwest of the effects of opening new habitat. The trap-and-haul operation on the South Fork Skykomish River caused major increases in coho production with access to this region (escapement in excess of 10,000 coho) plus other stocks (chinook, pink and steelhead) (Seiler, 1991). The installation of a ladder over barrier falls on the Deschutes River in south Puget Sound also developed runs of several thousand coho plus additional stocks. The addition of sockeye into the Lake Washington system has resulted in runs of several hundred thousand in some years. There are other non-regional examples in Alaska (e.g., Frazer Lake on Kodiak over 100,000 sockeye; Blackett, 1979) and the Great Lakes addition of salmon where none existed.

Although good information of effects of sediment releases from dam removal are not available, the Mt. Saint Helens eruption and resulting mud flows into the Toutle River provided an example of how very large inputs of sediment to a system can be cleared by natural action and can be tolerated by native stocks. The South Fork Toutle River had 50 million cubic yards of debris dumped into its watershed from the eruption (Lucas, 1985); within 3 years the stream was nearly clear and by 5 years had reached the escapement goal of 1,850 steelhead actively using the mainstem river for spawning (Lucas and Loch, 1991). This input is much higher than the expected output of the Elwha River dams removal (possibly 2 to 3 million cubic yards).

While the Mad River, where the Sweasey dam was located, has similar annual discharge, the pattern is much different and the quantity for the watershed area is considerably smaller. During the summer in the lower river, discharge is often less than 100 cfs. The Elwha River discharge would nearly always be greater than 200 cfs and usually greater than 400 cfs, which would improve late summer fish passage.

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JR-226: cont'd

The sediment release pattern from Sweasey dam removal was much different than what would occur with the dam removal plan for the Elwha River. The release with the Sweasey dam was one massive input because the dam was eliminated with one large explosion. Also, the material that was input from the Sweasey dam would also have different composition from that of the Elwha. The input from the Sweasey would have all components of the river in its 2.4 million cubic yards. The expected input from the Elwha will have a much higher proportion of fine sediment that will tend to leave the system more easily. The staff agrees though the stream bed in the lower river would likely change and be more abraded than it currently is; however, on the Elwha, this will have a less dramatic effect on migration than in the Mad River because of the higher low flow that occurs in the river having less effect on migration. Also, the high temperatures that occurred in the Sweasey are not likely to occur in the Elwha; the environment is much cooler than that of this region of the California coast.

According to the contacts with Don LaFonce (personal communication, former employee of California Department of Fish and Game, Biologist, February 7, 1992), 150 chinook were lost in the first year of Sweasey dam removal when the fish initially came in on a high rain runoff and then were stranded when the water level dropped. He did not indicate other years of direct mortality, although they could not be ruled out.

Concerning Mad River passage, during the first year of removal, a spawning survey on Cannon Creek about 5 miles below the dam was conducted and the counts were similar to periods before the dam was removed, suggesting that passage at least to this region was not stopped. Unfortunately, no further surveys were conducted at this site until 1982, so the intermediate effects on migration cannot be documented. However, the hatchery weir counts (beginning in 1971 to 1972) do indicate that some fish could traverse the lower river. Some other contacts from CDF&G suggest that within about 2 years or possibly slightly longer, most of the problem from the sediment for passage was greatly reduced. However, it was noted by Ken Gallagher (personal communication, California Department of Fish and Game, Hatchery Manager on the Mad River, Arcada, California, March 5, 1992) that even currently there are long, shallow riffle areas in the lower river that pose passage problems at low flows. This problem is exacerbated by the heavy gravel mining operation (about 11 gravel operations remove gravel directly from the river) in the lower river, and the extremely low flows that can occur in the lower river. Whether this may have been a natural occurrence before the dam was in place is not known.

JR-226: cont'd

Heavy upstream logging has also contributed to the sediment load in the Mad River, which may add to the lower river sediment. Ken Gallagher stated that currently little spawning occurs in the Mad River but little probably occurred before the dams were removed, so the effects to spawning production in this system were probably minor. The Elwha differs from this situation by not having a major gravel operation, logging, and relatively higher low-flow conditions, and would likely have cooler temperatures all of which would reduce the effects of sediment both concerning input and effects.

As was indicated by the comments, long-term impacts of the Sweasey dam removal are hard to separate from other environmental and human-caused impacts. However, some other differences are worth noting between the Sweasey situation and that considered for Elwha.

First, although the ladder at the Sweasey dam was considered an obstruction, it did allow some passage; however, there is no doubt that it was at times a block, but the degree to which it influenced return to this area cannot be documented. Some fish undoubtedly escaped above the ladder. The level relative to the actual potential production of the system may have been higher than thought by the agencies. Counts of fish over the ladder were made from 1939 through 1964. The last complete year of records (1963) indicated that 232 chinook, 1,419 coho and 2,904 steelhead passed the dam (Sweasey dam fish counts data from Ken Gallager, California Department of Fish and Game, Arcada, California, March 5, 1992). This data sheet suggested that the ladder was non- functional after 1964. Examination of the count data for the dam did not indicate a definite decline in escapement for steelhead or coho, only for chinook over this period. This suggests that the passage problems may have been just a recent occurrence, with the possible exception of chinook. What effect harvest or other factors had on the escapement over the dam for these stocks in not clear. Recent escapement as indicated in the commentor's table of weir counts does not state whether these are all hatchery take, wild fish, or how many went upstream. Therefore, it is difficult to determine what the real escapement is. Ken Gallager of the Mad River hatchery indicated that the weir is only operated 4 out of 7 days, so the counts reported are not complete. Also, the weir comes out about January 1, so any wild steelhead from this period would pass up river. Traditionally, the weir was temporary and would wash out with high flows. The relevance of this count to actual upriver escapement is difficult to interpret. Many hatchery counts have been generally lower in most years than the number of fish going over the ladder historically. Typically, the historical escapement of coho was less than 1,000; steelhead 3,000 to 6,000; and chinook about 500 to 1,000 (the highest count was 3,000). The range of hatchery counts have been generally about 500 for coho; 1,000 for steelhead; about 500 for chinook, although counts have been highly variable. The cause of this high variability is unknown but could be partly a function of weir operations.

JR-226: cont'd

The apparent decrease in escapement over the ladder with time for chinook may have been as much a function of factors outside of the basin as those in the basin. High ocean harvest rate may well have affected coho and chinook stocks in the past.

The recent drastic declines in chinook stocks in this system are probably a function of the drought conditions that have occurred for at least the last 5 or more years. For example, a tributary to the Eel River went from an escapement of 3,700 fish in 1987 to 1988 to zero in 1989 to 1990 (Pacific Fisheries Management Council, 1991). This reduction to zero chinook in the Mad River in 1990 to 1991 would appear to be a regional phenomenon independent of any dam-related activity.

The 3-mile movement of the river mouth may or may not relate to the dam removal activity. The low flows in recent years may contribute to its maintenance, although sediment from the dam removal could contribute, the exact causes are currently unknown. It is expected that with dam removal, a larger estuary will develop in the Elwha River mouth region. This type of development in this area of Straits would be considered a benefit, not a deficit, to fish production. The high summer temperature that occur in the current Sweasey River estuary are not likely to occur at the Elwha, again because of its more northerly distribution. The formation and retention of this long, shallow estuary in the Mad River is probably aided by the recent low-flow years.

As stated earlier, the high fine sediment load in the Mad River cannot be directly tied to the dam removal. The heavy logging activity and other develops may well contribute. This type of development does not occur in most of the Elwha.

Overall, the lack of change in increased production on the Mad River after dam removal cannot be tied directly to a failure of dam removal for the many reasons stated. In fact, it is not clear that production above the dam was ever seriously affected by poor passage except in the last few years that the ladder was in operation and possibly only for chinook salmon.

Although the Sweasey dam removal undoubtedly had some initial adverse effects, the lack of increase in fish production cannot claim to indicate that major increases in the Elwha would not occur from its removal. There are too many differences between the two situations to draw this conclusion. Also, additional examples indicate such an action on the Elwha River would result in substantially increased natural production.

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The potential effects of changes in the Elwha River channel downstream from the dam removal sites in not adequately addressed in the DEIS.

Potential changes in the mouth of the Elwha River caused by sediment release in the dams removal scenario should be more adequately discussed by the DEIS.

The DEIS should present more detail on methods to be employed to assure increased utilization of the Elwha River above the dam removal sites.

JR-227: The staff believes sufficient detail is presented concerning sediment stabilization effects in the downstream channel and the river mouth. More detailed information on these changes cannot reasonably be predicted.

The staff has presented a restoration plan for dam removal in Appendix A, Part 3.3.

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EXHIBIT

REVIEW OF ELWHA RIVER STOCK PRODUCTIVITY/RECRUITMENT

JR-228 1. Estimates of production of salmon, steelhead, and other trout from the Elwha when dams are retained (with passage devices) and when both dams are removed are seriously flawed in the case of steelhead, chinook, and perhaps coho. Estimates of maximum spawning population in the DEIS have been incorrectly used as optimum escapement levels necessary to produce MSY. This results in overestimates of harvest and spawning stock sizes for these species as well as in river biomass levels (DEIS tables 4-12 and 4-20).

JR-229 2. It is impossible from the information provided in the text to track the origin of the numbers used to prepare DEIS Table 4-14 and DEIS Table 4-21 to DEIS Table 3-5 which estimates production of pristine run sizes or in some instances spawning escapement to produce MSY. These tables are merely noted as being staff generated and provide no sources of listed information.

JR-230 3. For coho, pink, and chum, the matter is further confused. Although DEIS Table 3-5 reports these escapement levels as spawning escapement, the methods used to calculate the coho spawning population indicate these are maximum production spawning levels. For chums and pinks it is not clear what the numbers represent nor how harvest potentials have been derived.

JR-231 4. Although the DEIS recognizes the differential mortality imposed on juveniles and adults in different sections of the Elwha, the document applies the aggregate in-river mortalities (mortality through all reaches) to the entire downstream juvenile migration and upstream adult spawning populations regardless of the river area of origin or ultimate areas used by adults to spawn. In some instances, this results in a rather significant error in the calculation of the total in river passage mortalities. The mortalities on individuals inhabiting the areas below the dams, between the lower and upper dams, and above the upper dam will vary for each species. Revised estimates of production potential of the dams-in proposal, examined in light of these differential area/species mortalities, permit improved exploitation rates for the various salmon species and steelhead.

JR-232 5. Both the DEIS and the James River proposals of spawning requirements are based on the entire river bed (mainstream and tributaries) being available to spawners. In those instances when the total linear miles of potential spawning area have been used to estimate pristine spawning population sizes (dams removed), the river area under impoundment must be subtracted when calculating the required

JR-228: This response summarizes how potential production of salmon and steelhead was estimated for wild stocks with dams removed and with the applicant's proposal for dam retention. The final estimates of production were for runs characteristic of those to produce maximum sustainable yield harvest or a reasonable approximation.

Predicting potential production of salmon and steelhead in a river system is speculative at best because the results depend on many future factors which cannot accurately be predicted. The staff believes the estimates made here are reasonable, although future production could be substantially different than the values presented.

Potential production for both dam retention and dam removal used some information from the estimates for dam removal. Therefore, methods of estimating potential production for removal of both dams will be presented first.

DAM REMOVAL ESTIMATES

The staff believes the estimates presented by JFWA (1988), shown in Table 3-5, have reasonable rational for estimating potential production in the Elwha River system. Therefore, to help maintain consistency among the various estimates, the JFWA (1988) values were used as the initial bases for all potential production estimates. Variations of the average "upper" and "lower" values in this table were used for the major salmon and steelhead stocks. Where "upper" and "lower" values were not presented in this table, the ratio of the "upper" and "lower" estimates of coho salmon estimates were used to adjust the "upper" or "lower" estimate finally derived to estimate an average. Because of the uncertainty of any estimate, the staff believed this to be a reasonable adjustment for those without presented ranges. The following describes the estimation methods used for each major species without dams.

Chinook Salmon

The JFWA (1988) presented an upper level estimate for escapement of 17,493 fish for pristine production. The staff assumed that this estimate of escapement would be more representative of escapement between "equilibrium" (where escapement equals recruits) and "maximum" (the maximum number of recruits that can be produced) as defined in a Ricker curve function. Considering that historically some harvest of chinook would have occurred on the Elwha, the assumption that this value is representative of escapement at "equilibrium" is not valid. The upper escapement presented was first adjusted downward to account for this before final estimate of escapement at maximum sustainable yield was made.

JR-228: cont'd

The following calculations were used:

1. Maximum sustainable yield exploitation rate =

   $U_s = 0.78$

   See Appendix B for explanation of the value.

2. See Ricker (1975) Formula No. 21, Appendix III.

   $a = U_s - \log e\,(1-U_s) = 2.2941$

3. Set Recruit at equilibrium =

   $(Pr) = 1{,}000$

4. Escapement at maximum sustainable yield =

   $U_s = a \cdot P_s/P_r$

   where: P_s = maximum sustainable yield escapement

   (Formula No. 20 from Ricker (1975), Appendix III)

   $0.78 = 2.2941 \cdot P_s/1{,}000$

   $P_s = 340$

5. Escapement needed at maximum production =

   $P_m/P_r = 1/a$

   where: P_m = escapement at maximum production =

   $P_m/1{,}000 = 1/2.2941$

   $P_m = 436$

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6. The average of ratios of maximum sustainable yield escapement to equilibrium production escapement and maximum production escapement =

   P_s/P_r = 340/1,000= 0.340

   P_s/P_m = 340/436 = 0.780

   Average = 0.56

7. Upper escapement at maximum sustainable yield using the average ratio from 6 above =

   17,493 x 0.56 = 9,796

8. The ratio of high-to-low coho escapement to estimate this ratio for chinook =

   7,742/19,143 = 0.4044

9. The average escapement at maximum sustainable yield =

   [9,796 + (9,796 x 0.4044)]/2 = 6,879
   or approximately 6,900

10. Adult equivalent run, adult equivalent harvest, and adjusted harvest (assumed MSY harvest rate of 0.78, see Appendix B) follow.

    Adult run size at maximum sustainable yield =
    6,900/(1-0.78) = 31,364

    Adult equivalent harvest =
    31,364 - 6,900 = 24,464

    Harvest adjusted for incidental mortality and sub-adult harvest (memorandum from Gary Morishima, June 3, 1991, in NRC document in comments to the DEIS by James River 1991).

    Adjusted Harvest =
    24,464 x 0.961 = 23,510

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JR-228: cont'd Coho Salmon

Production parameters were calculated in a similar fashion to that of chinook with the following differences. The average escapement for the upper and lower were present from the JFWA (1988), so this average was directly determined. The JFWA (1988) used two different methods for estimating smolts, both have reasonable backing. The lower estimate is based on the smolt density method using that of Zillges (1977) for estimating smolt density. This method has been used in the past by the WDF to estimate potential production of streams in Washington. The other is the comparison of stream miles between the South Fork Skykomish River and the Elwha. This method is also reasonable for streams of similar geographic and environmental characteristics. Even though there are obvious differences between the Elwha and the South Fork Skykomish, the similarities make this estimate a reasonable method. Seiler (1991) for example used the comparison of stream miles of the South Fork Skykomish and that of the upper Snoqualmie River to estimate the potential production of the stream area above Snoqualmie Falls.

The estimates of coho escapement from these two methods were not believed to be as far from maximum sustainable yield as that for chinook. The upper value (19,143) was based on escapement in the South Fork Skykomish that would have exceeded maximum sustainable yield; however, the staff did not use this factor as the value directly only as an averaging factor. However, the lower number (7,742) was based on a fairly high number of smolts per adult (50); if the number were one-half of this, which is reasonable, the lower escapement estimate would be twice as high.

But, NRC pointed out that the area estimates used by the agencies in this estimate were high (the staff determined the overall estimate would reduce the smolt estimate to about 79 percent). However, the area estimate was made in a low-flow year, so even though this was adjusted for instream widths, it is likely that many small streams that were dry during the summer of the survey would have had flow during a normal year. Based on these factors, the staff considered the difference in area estimates to have minor effects on the estimates of production compared to the wider range of smolts produced per adult. Considering the many variables in estimating production, this was a minor point. However, the average of these two estimates (19,143 + 7,742)/2 = 13,443) was reduced to 90 percent of the average value (13,443 x 0.9 = 12,100) to account for the fact that the estimates used were in excess of maximum sustainable yield.

The estimated total production at maximum sustainable yield was calculated in a similar fashion to that of chinook using an assumed maximum sustainable yield escapement of 65 percent and a Ricker spawner recruit curve relationship (see Appendix B).

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Adult run size at maximum sustainable yield = 12,100/(1-0.65) = 34,571

Adult equivalent harvest = 34,571 - 12,100 = 22,471

Harvest adjusted for incidental mortality and sub-adult harvest (from memorandum by Gary Morishima, June 3, 1991, in NRC document in comments to the DEIS by James River 1991).

Adjusted Harvest = 22,471 x 0.964 = 21,662

By way of comparison, the Elwha River potential production, based on estimated South Fork Skykomish River escapement at maximum sustainable yield, would not be greatly different compared to stream miles available in the two systems. Average escapement in the South Fork Skykomish from 1979 to 1987 (without 1984 because of unusual fish behavior) was 17,100 at an average harvest rate of 59 percent. Assuming this system could be harvested at 65 percent for maximum sustainable yield, maximum sustainable yield escapement would be about 13,700 for this system assuming a Ricker spawner recruit curve relationship. Adjusting for stream miles between this and the Elwha (i.e., multiply Skykomish River escapement by 0.82 to account for fewer stream miles in the Elwha), the Elwha River escapement with this method would have been 11,200. This is over 90 percent of the estimate calculated above. Considering the various unknowns in estimating methods, the staff believes this alternate method of estimating confirms that the upper method is a reasonable estimate.

Steelhead

The estimated steelhead production again used the JFWA estimate adjusted for maximum sustainable yield. The ratio of coho was used to adjust for an upper estimate.

1. Although some differences occurred between the JFWA and James River parr estimates (difference was less than 7 percent), the staff used the James River estimate to estimate spawning escapement using the methods in Gibbons et al. (1985). Using the parr estimates (128,615), the average of three different Ricker and three different Beaverton-Holt spawner recruit methods for the maximum sustainable yield spawning escapement for the Elwha would be 3,301. These methods indicate an average maximum sustainable yield harvest rate of 43 percent and resulting total run of 5,791 (i.e., 3,301/(1-0.43) = 5,791).

2. The ratio of upper and lower coho escapement was used to generate

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cont'd

3. The average of the two run-size estimates equals the run size used: (5,791 + 14,334)/2 = 10,062 or approximately 10,100.

4. Escapement at maximum sustainable yield was assumed to be determined from a maximum sustainable yield harvest rate of 43 percent (see Appendix B):
Maximum sustainable yield escapement =
10,100 x (1-0.43) = 5,757.

The method of Gibbons et al. (1985) is based on the average values from several western Washington river systems. All of these watersheds have some environmental perturbations including logging and other activities. The staff believes that the potential production should be higher overall in the Elwha River system than these other systems because it has a majority of its habitat in the Olympic National Park is unaffected by development. The mean escapement values generated from the Gibbons' model have a wide confidence interval for estimates depending on the model used, ranging from 39 to 60 percent of the mean for an 80 percent confidence interval. Assuming an increase of 60 percent in the original estimated mean maximum sustainable yield escapement (3,301 to 5,282) and 43 percent harvest rate, the total run would be estimated at about 9,300 fish, which is within 90 percent of the value used by the staff. Again, this suggests that the estimate is reasonable.

Pink Salmon

The estimated run size of pink salmon was based on the average of the two escapement values presented by the JFWA (1988). Total run calculated by assuming average harvest rate of Puget Sound stocks was at maximum sustainable yield. Because less is known about pink salmon stock characteristics than the other stocks presented above, the staff does not believe information was sufficient to attempt to determine whether escapement estimates deviated substantially from maximum sustainable yield values. Therefore, the staff believed a conservative assumption of the escapement being representative of maximum sustainable yield was the most appropriate approach.

1. The escapement estimate was:
escapement = (56,000 + 137,000)/2 = 96,000

2. Assuming harvest rate at maximum sustainable yield of 65 percent, the total run = 96,000/(1 - 0.65) = 274,286

JR-228: cont'd

The estimate of pink salmon is more difficult than the previous stocks because the production often depends more on effects outside of the stream. However, a regional example of pink salmon production is present in the Dungeness River. Currently, the Dungeness River runs have been depressed, so recent estimates are probably a poor gage of future runs in the Elwha. Escapement estimates, before the most recent run depression, averaged about 82,000 from 1959 to 1979 (WDF, 1984). The Elwha River system has about 50 percent more drainage area and is much less perturbed. Therefore, it should be able support larger escapement than the Dungeness River, suggesting the 96,000 escapement value is a reasonable estimate.

The harvest rate at maximum sustainable yield is also difficult to determine. However, the 65 percent is typical of what is occurring to pink salmon stocks in Puget Sound and should be a maintainable harvest rate for this stock.

Chum Salmon

The chum salmon estimate was based on the escapement estimate from the JFWA, adjusted by the coho upper and lower estimate ratio, which assumed 50 percent harvest rate at maximum sustainable yield. The same lack of knowledge of what the escapement represents for pink salmon is the reason no adjustment of escapement was made.

1. Escapement at maximum sustainable yield =
   [25,600 + (25,600 x 0.404)]/2 = 17,971 or 18,000

2. Total run assumed the average maximum sustainable yield harvest rate estimated for lower British Columbia chum stocks at 50 percent from Beacham (1984). Based on this, the run size equals = 18,000/(1-.50) = 36,000

The regional chum runs are low, so little comparison can be made to these stocks. However, there are historical records, including substantial egg take (2 to 4 million eggs in 1919 and 1920 (James River, 1988)) on the lower river, indicating substantial runs of chums can exist in the Elwha River system. The historical egg take would have represented about 700 to 1,300 females (assuming 3,000 eggs per female). This would have been just on the production from the lower 5 miles of the river and they would have collected a small portion of the total run. As with pink salmon, rearing is controlled primarily in the marine environment, so the spawning area is the primary limiting factor for this stock in fresh water. The original estimate of production was based on 16 miles of river spawning habitat. Chum may be able to use additional habitat in tributaries for spawning and possibly mainstem regions farther upstream. If spawning habitat were available, this stock could reasonably produce the number of fish estimated.

JR-228: cont'd

DAM RETENTION WITH THE APPLICANT'S PROPOSAL

The estimate of production with dams in place was developed by considering dam passage mortality and habitat quality. The estimates used the run-size estimates for chinook, coho and steelhead for the no dam alternative and adjusted the estimates using three primary factors: (1) juvenile passage survival; (2) adult passage survival; and (3) habitat quality.

The allowable harvest rate of these stocks was based on the remaining harvest that could occur after accounting for passage mortality. Harvest of chinook and coho was adjusted the same for the removal of both dams.

The passage survival factors for adults and juveniles were all based on survival past both dams and reservoirs. While the theoretically allowable harvest rate could be different among the three river reaches based on different passage mortality, the staff does not believe adjustments were warranted for these differences.

First, for chinook, coho, and steelhead, the total habitat area is about 65 to 70 percent above Glines Canyon dam, 20 to 25 percent between the dams, and less than 10 percent below Elwha dam. These percentages do not account for the fact that the upper river overall habitat quality is greater than the middle and lower river.

Second, spawning habitat, particularly in the middle reach, is limited and seeding of the rearing area will require some movement of juvenile fish from above Glines Canyon so that many of the adults and juveniles that help seed this rearing habitat will have to pass Glines Canyon dam. This indicates that the survival of fish in the upper reach (the largest part of the habitat) and the middle reach (the second largest part of the habitat) will both be highly dependent on the survival of fish passing Glines Canyon dam. The lower reach accounts for a small portion of the total habitat in the system, so the fact that passage survival will be much higher has little effect on overall runs. Even if the habitat were seeded independently of passage above Glines Canyon to maintain the run size to each of these regions, they would either need to be harvested at independent rates or, as Dr. Morishima suggested, an overall optimum rate for all reaches.

An overall optimum harvest rate is theoretically possible, but it adds risk to the run maintenance. If the harvest rate is closer to the optimum of the middle or lower river reach, the upper run would be harvested at greater than optimum rate. Because of the uncertainty of the overall survival through the system, importance of maintaining lower harvest rates in this region because it is likely to produce the majority of the runs is important, the importance of the upper region spawning on seeding lower river areas, and higher quality habitat in the upper region, the staff chose the conservative approach of using the overall upper reach survival for the estimate of production of these stocks.

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The allowable harvest rate developed for dams in place is based on the maximum sustainable yield harvest rate from Appendix B adjusted for dam passage mortality. This new harvest rate is not, in the theoretical sense, a new maximum sustainable yield harvest rate but a more conservative harvest rate. The resulting values calculated with this method result in a slightly higher total fish run and escapement and slightly lower available harvestable numbers of fish and harvest rate than what a theoretical new maximum sustainable yield estimate would predict. Because (1) some uncertainty exists in what the true allowable harvest rate will be for an Elwha river stock; (2) uncertainty exists of what future passage mortalities will be; and (3) the relatively small difference between the theoretical and the staff method, the staff believes this conservative approach to be the preferred method of calculation to ensure that the final predictions will not be overly optimistic concerning both allowable harvest rate and harvest.

A general estimate of rearing habitat quality of the river compared to that of dam removal was made to adjust the overall potential production to that with the dams in place. One overall factor was determined for the whole river for each species. These factors were based on estimates of the relative potential of each of the three reaches adjusted for the proportion each reach accounts for the total production of the species.

The following formulas, using adjustment factors shown in the table below, were used to determine the potential production of chinook, coho, and steelhead with the applicant's proposal.

APWD	=	AP • JPS • HQF
AEWD	=	AE • HQF/APS
HRWD	=	(APWD - AEWD)/APWD
H	=	APWD - AEWD
HA	=	H • AEAF

Term Definitions:

AP	=	Adult production without dams
APWD	=	Adult production with dams
AE	=	Adult escapement without dams
AEWD	=	Adult escapement with dams
HRWD	=	Harvest rate with dams
H	=	Harvest of adult equivalents
HA	=	Harvest adjusted for incidental mortality and sub-adult harvest
JPS	=	Juvenile passage survival rate
HQF	=	Habitat quality factor
APS	=	Adult passage survival
AEAF	=	Adult equivalent adjustment factor

JR-228: cont'd

Factors used to estimate potential production with the applicant's dam retention alternative.

	Species		
Factors	Chinook	Coho	Steelhead
Juvenile Passage Survival[a/]	0.64	0.83	0.85
Habitat Quality Factor[b/]	0.80	0.87	0.85
Adult Passage Survival[c/]	0.86	0.86	0.85
Adult Equivalent Adjustment Factor[d/]	0.964	0.961	1.0

a/ Downstream survival past both dams.
b/ Estimated potential production of the habitat relative to without dams.
c/ Upstream passage survival past both dams.
d/ Adjustment factor to account for incidental mortality and sub-adult harvest (source: memorandum from Gary Morishima, Fisheries Management Consultant, Mercer Island, Washington, June 3, 1991).

Because of the poor juvenile passage survival of pink and chum salmon passed through Lake Aldwell and Elwha Dam, production with dams in place was assumed to stay the same as what currently exists.

The staff's methods are not seriously flawed. Maximum spawner populations were not used where estimates could be identified as maximum spawner numbers.

The escapement numbers are slightly higher than what would be predicted on a purely theoretical basis. However, the staff considered the risk and uncertainty of the values used in the analysis and incorporated a more conservative estimating method for dam retention.

JR-229: Refer to response JR-228.

JR-230: Refer to response JR-228.

JR-231: Refer to response JR-228.

JR-232: The values were adjusted for habitat differences (see response JR-228). However, at population levels less than maximum equilibrium levels, all spawning areas are not needed, so the loss of spawning habitat is not directly one-for-one in reducing production methods. The staff agrees that reservoirs can be used for rearing habitat; however, their exact quality relative to the river is not directly comparable.

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spawning population for the "client's" (dams-in) proposal. For species limited by stream rearing habitat, impoundment areas would be included when calculating the required number of spawners to seed the habitat for MSY.

Establishing optimum escapement production levels

The DEIS presents estimates of potential production for nine Elwha River anadromous stocks (DEIS Table 3-5). We have examined in detail those for chinook, coho, and steelhead. Some work has also been completed on sockeye and pink salmon. Because the DEIS does not document the basis for its production estimates (Tables 4-14 to 4-21), we have relied upon the information provided in DEIS Table 3-5 and information in the Joint Fishery Agencies' (JFA) Report of August 1988 to derive estimates of pristine spawning levels. The following discussion examines productivity by species:

Chinook

JR-233

We have accepted the Ricker "a" value used in the DEIS and the use of 368 spawners per run mile (mainstream) as a high estimate of the Elwha chinook spawning requirements for "pristine" escapement levels. Although Table 3-5 of the DEIS categorizes its upper estimate for chinook (which was derived using the 368/mile estimate) as spawning escapement, it is clear from the JFA report (page 32) that this estimate is for "under pristine conditions" and thus is equal to equilibrium run size (harvest is zero under pristine conditions). Use of optimum escapement numbers to achieve MSY production which leads to a maximum spawning population exceeding 368 per mile seems unlikely. We have thus used 17,493 as constituting the pristine equilibrium escapement, although the number is viewed as optimistic.

This number can then be used (via Ricker curves) to estimate MSY and sustained yield at MSY. However, in calculating the production of chinook (dams-in), it was deemed desirable to treat the productive capacity of the various river sections (below dams, between dams, and above the upper dam) as independent stock units inasmuch as each river section was subject to different levels of downstream and upstream dam or impoundment mortalities. An estimate of pre-spawning mortality loss was included in the dams-in evaluation which was not included in the DEIS. Estimates of applicable population mortalities for each of the river sections for chinook (Table 1) are based on (a) the portion of the total spawning population and smolt production which would occur in each river sector times (b) the downstream and upstream mortality to which each population sector would be exposed. (See Table 1 for chinook mortality coefficients used.)

JR-233: See response JR-228. Whether the river is rearing or spawning limited is unknown. The staff considered rearing habitat important in the system in our habitat rating.

Chinook

Even if the assumption is made that rearing habitat is limiting the potential production estimates, the estimated numbers are not likely to be lower with or without the dams.

As an example, the staff estimated the potential production based on a rearing limited alternative as stated in response JR-228. The staff chose rearing density values developed for the Columbia River basin fall chinook (NPPC, 1989).

The following summarizes the calculations and assumptions used with the method applied to the Elwha River.

1. The NPPC (1989) used a rearing density of 1.8 smolts per square meter (i.e., 1.5 smolts per square yard) for habitat classified as "excellent" or "good" for fall chinook. The total Elwha River habitat was considered in this category for calculation purposes. Even if some of the habitat, particularly in the middle or lower reach was considered of lesser quality, this would not reduce overall smolt numbers substantially because the middle and lower reaches are a small portion of the total habitat. But using this density value may slightly overstate total potential smolt production.

2. The NPPC (1989) applies this density up to a stream width of 60 feet, and streams greater than this have only this width applied. The staff further restricted rearing habitat to streams at least 18 feet wide, as streams smaller than this were not considered suitable for spawning (JFWA 1988), making rearing in smaller streams unlikely. The staff included the reservoirs (as 60-foot wide channels) in the estimate of rearing areas.

3. The resulting rearing area and smolt estimate follows:

	Area (yd²)	Smolts	% of Total
Lower reach	172,480	258,720	10
Middle reach	302,720	454,080	18
Upper reach	1,173,200	1,759,811	71
Total	1,648,407	2,472,611	100

JR-233 cont'd

The equilibrium escapement for each sector was then considered in light of unit/area populations and area-specific passage mortalities to develop the characteristics of the Ricker curves for each of the population units (Appendix III). The composite production aspects for the James River proposed dams-in scenario are then developed, based on an exploitation rate that optimizes the sustainable harvest from the three Ricker curves (Table 2).

The above estimate of 17,493 spawners associated with pristine equilibrium escapement assumes that chinook are spawning-limited in the reaches above Glines Canyon dam and below Elwha dam. Based upon our review of the DEIS and JFA, we express some doubts regarding this conclusion. The JFA state that their first assumption in using spawners/mile to calculate escapement is that "Elwha chinook exhibit a predominantly spring sub-yearling outmigration pattern and natural production is therefore spawning-limited."

Table 1. Summary of passage mortality and smolt production estimated for chinook salmon in the Elwha River.

	Smolt Production Prior to Migration	Passage Mortality by River Reach	Smolt Production After Considering Passage Mortality	Cumulative Survival
Upper Reach	83.00%	24.57%	80.00%	
Middle Reach	4.00%	9.61%	4.00%	
Lower Reach	13.00%	0.00%	16.00%	
				76.03%

JR-233: cont'd

4. An egg-to-smolt survival from the North Fork Lewis River fall chinook was used to estimate spawning escapement to produce this number of smolts. Egg-to-presmolt survival for fall chinook is 9 percent for the North Fork Lewis River (McIsaac, 1990). The staff assumed that presmolt survival equaled smolt survival, which may cause a slight overestimation of egg-to-smolt survival. This, in turn, would result in an underestimation of needed spawners. The North Fork Lewis River fall chinook population was approximately at maximum production for this egg-to-presmolt survival value (as defined by Ricker spawner recruitment curve; McIsaac, 1990).

5. Escapement is calculated by the following equation:

   2,472,611 smolts • 2 spawners/female • female/5,250 eggs • egg/0.09 smolts = 10,466 spawners

6. The number of spawners was assumed to equal maximum production as defined in a Ricker curve (Ricker, 1975). The staff used the Elwha River chinook production characteristics as defined in Appendix B (i.e., maximum sustainable yield (MSY) harvest rate of 78 percent). Using Formula No. 21, Appendix III from Ricker (1975), the Ricker a value = 2.2941.

7. Using the above parameters, spawners at equilibrium can be calculated:

   $P_m/P_r = 1/a$

   (Formula No. 9, Appendix III, Ricker (1975)).

   where:

   P_m = spawners needed at maximum recruitment
   P_r = spawners needed at equilibrium
   a = Ricker a

   $10,466/P_m = 1/2.2941$

   $P_m = 24,010$

8. Maximum sustainable yield escapement is calculated:

   P_r = MSY escapement/(0.5 - 0.07 • a)

   (Formula from Hilborn, 1985.)

   24,010 = MSY escapement/(0.5 - 0.07 • 2.2941)

   MSY escapement for Elwha River = 8,149

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Table 2. Production potential for fall chinook in the Elwha River.

ITEM	No Dams	Dams-No Prespawn Mortality	Dams-With Prespawn Mortality
ENTIRE SYSTEM			
Ricker A Value (Avg. P Snd & W Cst EIS B-22)	2.29		
Equilibrium Escapement (EIS Tab 3-5)	17,493		
AREA BELOW ELWHA DAM			
Ricker A Value (same)		2.29	2.29
Equilibrium Escapement (368 sp/mi (JFWA) x 4.9 mi) (EIS Tab 4-3)		1830	1830
Pre-Spawning Mortality (State-Tribes '90 report)			0.11
AREA BETWEEN ELWHA & GLINES DAMS			
Ricker A Value (same)		2.29	2.29
Equilibrium Escapement (DEIS 3-33,4-20)		500	500
Downstream Passage Mortality of Juveniles at Elwha Dam (NRC)		.096	.096
Upstream Passage Mortality of Adults at Elwha Dam (EIS Tab 4-7)		.075	.075
AREA ABOVE GLINES DAM			
Ricker A Value (same)		2.29	2.29
Equilibrium Escapement (368 sp/mi (JFWA) x 27.0 mi (NRC) + 121 sp/mi (JFWA) x 9.8 mi (NRC)		11,122	11,122
Downstream Passage Mortality of Juveniles at Glines Dam (NRC)		.168	.166
Upstream Passage Mortality of Adults at Glines Dam (EIS Tab 4-7)		.075	.075
RESULTS			
MSY Spawning Escapement	5,952	4,211	3,906
MSY Escapement from Fisheries	5,952	4,758	4,511
Sustained Yield at MSY Escapement	21,013	11,103	9,587
Sustainable Exploitation Rate at MSY Escapement	77.9%	70.0%	68.0%

JR-233 cont'd

Studies conducted in 1989 and documented in the March 15, 1990, James River report do not support such an assumption. Chinook ATPase levels associated with smolting and spikes in downstream outmigration past the Glines Canyon dam are not in evidence until late summer/early fall. These findings suggest that significant numbers of chinook juveniles may be holding in the upper reach during low-flow, possibly high-stress periods in the August and September or later period. High mortalities could ensue and would suggest a rearing-limited system for chinook in the upper reach. The DEIS also indicates that given the large amount of available spawning habitat, the "chinook rearing area could be limited in the upper area." Similar reasoning applied to the lower reach would suggest that the below-Elwha dam river section is also rearing-limited.

Production by stream section changes substantially if chinook are indeed rearing-limited in the upper and lower reaches. The

JR-233: cont'd

9. Total run was determined:

$$R = P_e^{a(1-P/Pr)}$$

where:

P = Escapement
R = Total run

$$R = 8{,}149e^{2.2941(1-8{,}149/24{,}010)}$$

$$R = 37{,}091$$

Based on this method, estimated production would be higher than the value used. This suggests that even using rearing as a limiting factor, production with or without dams would not likely be less than the values used in the staff estimate using JFWA data.

Coho

The difference between the JFWA's estimates and the applicant's estimates for coho stream rearing habitat does not substantially affect the estimated smolt production potential if the Zillges (1977) calculation method is used. Using Zillges' (1977) method, the applicant's stream rearing habitat calculation is estimated to produce 304,715 smolts, and the JFWA's (1988) estimate is 387,085 smolts. The applicant's estimate of 304,715 smolts is 79 percent of the JFWA's value. This is a minor difference when considering the other important factors that affect production estimates (see response JR-228).

application of reasonable estimates of chinook juvenile density/square yard to production calculations for the two reaches shifts chinook production away from the upper reach when compared against the spawning-limited scenario.

Estimates of production potential also change under a rearing-limited scenario. NRC determined that under a rearing-limited condition, any smolt density below 0.71 smolt/sq yd will reduce Elwha in-river smolt production below that possible under spawning-limited conditions. Using smolt densities of 0.2 per square yard (NWPPC, 1986) for Elwha chinook, total adult production at MSY, without dams, drops from 26,965 under spawning-limited conditions to 19,640 if rearing-limited conditions exist. With dams in place, production falls to 12,186 from its spawning-limited level of 15,861. While definitive results cannot be obtained from available data, these preliminary findings indicate the chinook production characteristics of the Elwha under a rearing-limited situation would be distinctly different from those that typify a spawning-limited system. If habitat is truly rearing-limited for chinook in the Elwha, estimates based on spawning-limited conditions (17,493) are optimistic. Further work is needed to clarify the factors limiting chinook production in the Elwha and accurately define chinook smolt densities in the basin.

JR-233 cont'd

Coho

Estimates of coho production potential derived through both the "full seeding" alternative (lower estimate, DEIS Table 3-5) and the upper estimate of spawning escapement obtained via a comparison of the South Fork of the Skykomish are troubling. The lower value (7,742), which assumes that coho are rearing-limited and that is based on smolt per yard of mainstream, large tributaries, and small tributaries, seems to contain a mathematical calculation error. The calculation of square yards of small tributary habitat (square yards) greatly exceeds that provided in the documentation of available areas in stream tributaries. The DEIS/JFA calculation of 324,489 square yards is unsubstantiated and is roughly three times our calculations of available spawning area in small-stream tributaries. It appears that this estimate includes some streams with widths greater than six yards that had already been included by the JFA in its estimate of large tributary contributions to production. Our calculation of small tributary smolt area without this double-counting is 144,741 square yards.

The upper estimate of "spawning escapement," based on a comparison of the Elwha with the South Fork of the Skykomish, does not provide any details of the river habitat measurements in the South Fork and hence cannot be satisfactorily compared with the Elwha. Comparisons of total river mileage as a basis of relative

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habitat may be highly misleading. Further, the average Skykomish South Fork escapement for the period 1979-1981 that is presented in the JFA analysis--23,269--exceeds current WDF management escapement goals (12,000-15,000 coho) by roughly 10,000 fish. It is the view of the NRC team that, given coho life history characteristics, the full seeding estimate is the better estimate. However, the DEIS number--7,742--needs to be adjusted for the error in calculating available habitat. Adjusting for the error leads to a "full seeding" requirement of 6,241 adults.

Using this value and following the procedure laid out for chinook (i.e., application of area-specific coho mortalities, Table 3), we have calculated new production numbers for coho, using 50 smolts per adult (Ricker "a" value of 1.52) and 35.5 smolts per adult[1] (Tables 4 and 5).

Table 3. Summary of passage mortality and smolt production estimates for coho in the Elwha River.

	Percent Smolt Production Prior to Migration	Mortality by River Reach	Percent Smolt Production After Considering Downstream Mortality	Cumulative Survival
Upper Reach	67.00%	15.20%	64.00%	
Middle Reach	26.00%	3.18%	28.00%	
Lower Reach	7.00%	0.00%	8.00%	
				88.96%

[1]In: DEIS and Moring, J. R., and R. L. Lantz. 1975. The Alsea Watershed Study: Effects of Logging on the Aquatic Resources of Three Headwater Systems of the Alsea River, Oregon, Part I. Biological Studies, Fish Res. Rpt.

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cont'd

Table 4. **Production potential for coho salmon in the Elwha River assuming 50 smolts per coho spawner.**

ITEM	No Dams	With Dams 50 Sm/Sp
ENTIRE SYSTEM		
Ricker A Value (OER .60)	1.52	
Full Seeding Escapement (EIS Tab 3-5 Corrected by NRC)	6,241	
AREA BELOW ELWHA DAM		
Ricker A Value (same)		1.52
Full Seeding Escapement (21,500 smolts (NRC)/50 smolts/sp (JFWA))		431
AREA BETWEEN ELWHA & GLINES DAMS		
Ricker A Value (same)		1.52
Full Seeding Escapement (80,703 smolts (NRC)/50 sm/sp (JFWA))		1,614
Downstream Passage Mortality of Juveniles at Elwha Dam (NRC)		3.2%
Upstream Passage Mortality of Adults at Elwha Dam (EIS Tab 4-8)		7.5%
AREA ABOVE GLINES DAM		
Ricker A Value (same)		1.52
Full Seeding Escapement (209,769 smolts (NRC)/50 sm/sp (JFWA))		4,195
Downstream Passage Mortality of Juveniles at Glines Dam (NRC)		12.4%
Upstream Passage Mortality of Adults at Glines Dam (EIS Tab 4-8)		7.5%
RESULTS		
MSY Spawning Escapement	3,752	3,250
MSY Escapement from Fisheries	3,752	3,651
Sustained Yield at MSY Escapement	5,652	4,117
Sustainable Exploitation Rate at MSY Escapement	60.1%	53.0%

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Table 5. Production potential for coho salmon in the Elwha River assuming 35 smolts per coho spawner.

ITEM	No Dams	With Dams 35.5 Sm/Sp
ENTIRE SYSTEM		
Ricker A Value (OER 65)	1.7	
Full Seeding Escapement (EIS Tab 3-5 Corrected by NRC)	5,790	
AREA BELOW ELWHA DAM		
Ricker A Value (same)		1.7
Full Seeding Escapement (21,500 smolts (NRC)/35.5 smolts/sp (see below))		607
AREA BETWEEN ELWHA & GLINES DAMS		
Ricker A Value (same)		1.7
Full Seeding Escapement (80,693 smolts (NRC)/35.5 sm/sp (see below))		2,273
Downstream Passage Mortality of Juveniles at Elwha Dam (NRC)		3.2%
Upstream Passage Mortality of Adults at Elwha Dam (EIS Tab 4-8)		7.5%
AREA ABOVE GLINES DAM		
Ricker A Value (same)		1.7
Full Seeding Escapement (209,769 smolts (NRC)/50 sm/sp (JFWA))		5,909
Downstream Passage Mortality of Juveniles at Glines Dam (NRC)		12.4%
Upstream Passage Mortality of Adults at Glines Dam (EIS Tab 4-8)		7.5%
RESULTS		
MSY Spawning Escapement	5,713	5,172
MSY Escapement from Fisheries	5,713	5,815
Sustained Yield at MSY Escapement	10,614	8,030
Sustainable Exploitation Rate at MSY Escapement	65.0%	58.0%

Estimated spawners required for full seeding was based on 35.5 smolts per spawner, a value derived from:
Moring, J.R. and R.L. Lantz. 1975. The Alsea Watershed Study: Effects of Logging on the Aquatic Resources of Three Headwater Systems of the Alsea River, Oregon, Part I, Biological Studies. Fish Res. Report 9, ODFW.

Steelhead

For steelhead, we have accepted the 8,651 estimate provided in the text (DEIS Table 3-5) as the best available information on the equilibrium pristine spawning population level. As with chinook and coho, area-specific mortalities (Table 6) are used (dams-in) for the adult or juvenile population which spawn or have their origin in the three major sectors of the river. Steelhead production estimates resulting from this estimate are provided in Table 7.

We have compared overall results of the above analyses with those of the DEIS in Tables 8a and 8b.

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cont'd

Table 6. Summary of passage mortality and smolt production estimates for steelhead in the Elwha River.

	Percent Smolt Production Prior to Migration	Mortality by River Reach	Percent Smolt Production After Considering Downstream Mortality	Cumulative Survival
Upper Reach	67.00%	13.89%	65.00%	
Middle Reach	27.00%	5.99%	28.00%	
Lower Reach	6.00%	0.00%	7.00%	
				87.31%

Table 7. Production potential for winter steelhead Elwha River.

ITEM	No Dams	With Dams
ENTIRE SYSTEM		
Ricker A Value (.43 OER EIS p B-24)	0.992	
Equilibrium Escapement (from JFWA p 31)	8,651	
AREA BELOW ELWHA DAM		
Ricker A Value (same)		0.992
Equilibrium Escapement (6% of total prod potential - NRC)		519
AREA BETWEEN ELWHA & GLINES DAMS		
Ricker A Value (same)		0.992
Equilibrium Escapement (27% of total prod potential - NRC)		2,336
Downstream Passage Mortality of Juveniles at Elwha Dam (NRC)		10.78%
Upstream Passage Mortality of Adults at Elwha Dam (EIS Tab 4-9)		7.50%
AREA ABOVE GLINES DAM		
Ricker A Value (same)		0.992
Equilibrium Escapement (67% of total prod potential - NRC)		5,796
Downstream Passage Mortality of Juveniles at Glines Dam (NRC)		8.41%
Upstream Passage Mortality of Adults at Glines Dam (EIS Tab 4-9)		7.50%
RESULTS		
MSY Spawning Escapement	3,749	2,745
MSY Escapement from Fisheries	3,749	3,069
Sustained Yield at MSY Escapement	2,828	1,444
Sustainable Exploitation Rate at MSY Escapement	43.0%	32.0%

EXHIBIT

Table 8a Present and predicted future total adult production, harvest, and escapement of fall chinook, coho, winter steelhead, chum, and pink salmon under the removal of both dams alternative. Source. DEIS and NRC.

	Chinook		Coho		Winter Steelhead		Chum		Pink	
	Present	Future	Present	Future	Present	Future	Present	Future	Present	Future
Adult Production										
DEIS	13,500	34,000	22,000	39,500	4,000	5,721	<1,000	36,000	<100	274,286
NRC		26,965		16,327		6,577		Not Studied		Not Studied
Harvest Rate										
DEIS	80%	78%	90%	65%	90%	43%	Unknown	50%	Unknown	65%
NRC	84%	78%	90%	65%		43%		Not Studied		Not Studied
Harvest										
DEIS	10000 [1]	26,520	19,800	25,675	3,600	4,386	Unknown	18,000	Unknown	178,286
NRC		21,013		10,614		2,828		Not Studied		Not Studied
Escapement										
DEIS	3,500	7,480	2,200	13,825	400	5,184	Unknown	18,000	Unknown	96,000
NRC		5,952		5,713		3,749		Not Studied		Not Studied

Note: Pink and chum are not included because adequate data were not available to estimate production parameters

Table 8b: Present and predicted future total adult production, harvest, and escapement of fall chinook, coho, winter steelhead, chum, and pink salmon under the dam retention scenario. Source: DEIS and NRC.

	Chinook		Coho		Winter Steelhead		Chum		Pink	
	Present	Future	Present	Future	Present	Future	Present	Future	Present	Future
Adult Production										
DEIS	13,500	19,351	22,000	30,146	4,000	7,344	<1,000	<1,000	<100	<1,000
NRC		14,098		13,845		4,513		Not Studied		Not Studied
Harvest Rate										
DEIS	80%	59%	90%	52%	90%	17%	Unknown	Unknown	Unknown	Unknown
NRC	84%	68%	90%	58%		32%		Not Studied		Not Studied
Harvest										
DEIS	10000 [1]	11,487	19,800	15,678	3,600	1,231	Unknown	Unknown	Unknown	Unknown
NRC		9,587		8,030		1,444		Not Studied		Not Studied
Escapement										
DEIS	3,500	7,864	2,200	14,468	400	6,113	Unknown	Unknown	Unknown	Unknown
NRC		4,811		5,815		3,068		Not Studied		Not Studied

Note: Pink and chum are not included because adequate data were not available to estimate production parameters.
[1]Note that the harvest values under present conditions shown in the DEIS and used in this table (10,000) constitute a 0.74 exploitation rate
If the higher exploitation rate (0.8) is used, an additional 800 fish would be harvested, raising the total harvest to 10,800 and reducing escapement values to

JR-233 cont'd

Based on the new estimates from NRC, construction of the fish passage facilities at the Elwha and Glines Canyon dams would lead to a slight improvement in chinook harvest possibilities over the current potential documented in Table 4-14 of the DEIS. Considering the stated DEIS present condition of salmon runs, chinook harvest would roughly double following full restoration after dam removal. Coho harvest (dams in), by contrast, would be only about half that of the present catch and improve only slightly under the dams-removed scenario. For steelhead, there is also a significant decline in harvest opportunities when comparing the future options with present conditions. Thus, under either scenario, coho and steelhead runs and harvest are very likely to decline.

We feel the population numbers that we have used for chinook and steelhead are supportable, although optimistic for chinook, if this species is something other than spawning-limited in the Elwha. There may be, however, a criticism that our estimate for pristine spawning stock size for coho is too small. Nevertheless, even if we base production on eight-tenths of current WDF escapement goals of the South Fork of the Skykomish, the production of coho (dams-out) is at best no greater than the current harvest potential.

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EXHIBIT

OTHER FACTORS INFLUENCING ELWHA RIVER STOCK PRODUCTIVITY

Three principal issues will be addressed in this section: a review of the impacts of assumptions of rearing-limited vs. spawning-limited conditions for chinook salmon, a quantitative means of ranking passage suitability, and a discussion of inconsistencies noted in the DEIS and JFA reports.

Rearing-Limited vs. Spawning-Limited Conditions

Most production values in the DEIS assume spawning-limited or some mixture of spawning- and rearing-limited conditions for the subject species. We strongly recommend that because of the unique characteristics of the Elwha, de facto assumptions of spawning-limited populations for these species not be made.

JR-234 Chinook is a prime example of the potential difference in the production characteristics of a spawning- vs. rearing-limited population. With a spawning-limited population, in all three reaches of the river the distribution of production is 83%, 4%, 13%--upper, middle, and lower reaches, respectively. As noted in the DEIS, however, spawning habitat may not be limiting in the upper and lower reaches. Applying reasonable chinook smolt densities of 0.14 to 1.4/sq yd[2] to these two reaches shifts the distribution of production downward significantly in the upper reach, while increasing that in the lower and middle reaches by several factors. The application of a rearing-limited life history pattern and a smolt density of 0.20/sq yd[3] (NWPPC, 1986) reduces smolt production, total adult production and sustainable yield downwards from values associated with the spawning-limited condition.

The importance of the differences introduced by the clarification of limiting factors for chinook and perhaps other species should not be overlooked.

River Dams

JR-235 Because access to the upper reach will provide less production when chinook or other species are rearing limited, costs of dam removal or fisheries enhancement to permit access to the upper reach will provide fewer benefits than assumed in earlier analyses. Furthermore, in the case of chinook, if smolt densities greater than 0.71/sq yd exist in the river,

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[2]Rates of from 0.01 to 1.6 smolts per square yard have been reported by several authors and documented in Volume 3 of the May 27, 1988, response to Request for Additional Information of May 28, 1987.

[3]Northwest Power Planning Council Technical Planning Report, October 22, 1986.

JR-234: See response JR-228. The staff presented a rearing density estimate that does not vary greatly from the JFWA (1988) spawning limitation method that the staff employed. The staff agrees that whether the system will ultimately be spawning or rearing limited cannot be determined. However, either method results in similar size runs at maximum sustainable yield.

The staff believes that your density ranges are lower than what would be expected based on data from NPPC (1989).

JR-235: See response JR-233.

JR-235 cont'd improvements in potential production, sustainable exploitation rate (SER)[4], and MSY escapement may make restoration of this species all the more feasible. Such break-even densities and associated improvements in restoration feasibility should be determined for other species.

Reassessment of Passage Mortality Criteria

Given knowledge of exploitation rates that are feasible under existing or future management regimes, quantitative assessments of the "favorability" of different passage mortalities can be made.

JR-236 SER is partially a function of downstream survival of juveniles and upstream passage survival of adults (Appendix III). Solving for downstream passage survival at a predetermined minimum SER determines the minimum allowable passage survival for the subject species. Lower passage survival rates will lead to lower SER which are not feasible, given the stock's distribution and existing/expected management practices. Such lower passage survival values would be judged unfavorable, while those at or above the minimum value could be distinguished as favorable.

Consider chinook as an example. It is NRC's opinion that a reduction in the Elwha chinook exploitation rate below the current 64% level (the DEIS estimate of an 80% current exploitation rate appears to be in error) is unlikely. Using this 64% rate as the SER, the minimum acceptable passage mortality for chinook is 65%. Any passage survival values above 65% would be judged favorable for restoration under this scenario. NRC's estimate of juvenile passage survival of 76% for chinook meets this criteria. NRC's rating of passage conditions as favorable for chinook salmon is in contrast to the marginally favorable ranking assigned by the DEIS.

Applying the same procedure to coho salmon suggests the passage survival value for this species is unfavorable, since over 100% coho juvenile survival would be required to meet the minimum SER requirements for that species. The result also indicates that even without the dams (passage survival equal to 100%), coho SER requirements cannot be met. This conclusion is supported by other findings later in this report.

NRC recommends adoption of this procedure for these and other stocks of interest in the Elwha.

Inconsistencies in the DEIS

JR-237 1. JFA estimate of coho spawning area: On page 31 of the JFA comments, the JFA use a figure of 324,489 square yards of rearing habitat in small

[4] Sustainable exploitation rate is the level of allowable level of man-induced mortality occurring over the previous year on a particular stock an maximum sustainable yield.

JR-236: See response JR-228. The staff has incorporated the 64 percent harvest rate into our calculation. However, the staff disagrees with the methods proposed for assessment. Considering uncertainties of production characteristic of the stock and future passage survival, the staff believes our method appropriate. Your determinations are based on the assumption that no change in future harvest regime is possible. There are mechanisms to modify harvest through local harvest management and treaty actions.

JR-237: See response JR-233.

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JR-237 cont'd

tributaries (<6 yards) of the Elwha. Summation of small tributary areas on a creek-by-creek basis in the Elwha basin produces an estimate of only 144,741 square yards. The use of the higher estimate by the JFA leads to an overestimate of the potential production of coho in the Elwha river.

JR-238

2. The DEIS states that restoration potential for pink and chum salmon is good despite its admission that stock availability for both species is marginal. This inconsistency creates significant overestimates of the potential benefits of dam restoration, e.g., allowable harvest and available biomass for carnivores inhabiting the Elwha drainage. Discounting the chum and pink estimates, salmon and steelhead production without the dams is 26,000 fish greater than with the dams in place. This value is far less than that calculated with pink and chum salmon (337,000 fish difference between with-dam and without-dam scenarios). Available biomass for carnivores inhabiting the Elwha basin is also reduced accordingly.

JR-239

3. The JFA bases its assumption of a spawning-limited population of chinook in all reaches of the river on the "predominantly spring sub-yearling outmigration" of chinook juveniles. Such a spring outmigration is inconsistent with available outmigration data for chinook in the Elwha. These data suggest a late summer to early fall outmigration.

JR-240

4. Inherent within DEIS and JFA comments on pink salmon restoration feasibility is the assumption that restoration is not feasible without access of this species to the middle reach of the river. Because large pink runs occurred in the river prior to 1979, this assumption appears improper.

JR-241

5. The source of results presented in DEIS Table 3-5 is unclear and application of these values to production, harvest, and escapement estimates inconsistent.

JR-242

6. It does not appear the DEIS included incidental fishing mortality loss in calculating MSY yields for chinook and coho.

JR-243

7. DEIS Table 3-6, concerned with historical chinook production, does not produce an exploitation rate of .8 as stated for present conditions in DEIS Tables 4-14 and 4-21.

JR-244

8. Implied historical catch for coho, chinook, and steelhead (DEIS Tables 3-6, 3-7, and 3-8) do not seem to lead to "present" run size data presented in DEIS Tables 4-14 and 4-21. The source of these numbers is not indicated.

JR-238: This is not inconsistent; it downgrades the rating but does not eliminate the restoration potential. See response JR-228. The staff believes the presented estimate is reasonable.

JR-239: Spawning can still be limited with outmigration that occurs other than in the spring. But even with rearing limitations, the overall estimate of potential production would likely be similar (see response JR-233).

JR-240: The staff believes without meaningful access to more than one-third of potential habitat, restoration is not possible.

JR-241: See response JR-228.

JR-242: The staff has included incidental mortality as presented in NRC (1991).

JR-243: Tables 4-17 and Table 4-27 have been modified.

JR-244: The staff used harvest rates presented by NRC for modifying Tables 4-17 and 4-27 instead of recent escapement numbers.

POTENTIAL FOR SUCCESSFUL WILD STOCK RESTORATION ON THE ELWHA RIVER

Stock restoration under the DEIS is considered in light of four major factors: passage, allowable exploitation rates, habitat, and stock selection and availability. All of these factors are considered as legitimate criteria, and as noted in the James River comments on the topic, failure of any one of the four restoration criteria could prevent or sharply reduce the possibilities of stock restoration. In NRC's view, one additional factor should have been considered, that is, the ability of state, national, and international management entities or agreements to control exploitation rates within the limits of stated harvest goals.

Assessment of management capabilities is, of course, a highly subjective arena and one that is not readily quantifiable. Nevertheless, all options are dependent on effective and timely management decisions and implementation abilities. The DEIS should, at a minimum, note current U.S./Canada conflicts over appropriate salmon management strategies and harvest regimes. Further, there is the question of national and state management effectiveness and its capacity to limit environmental degradation. If one reviews the performance of salmon management in the
JR-245 Northeast Pacific, including its ability to control illegal high seas fishing, limit bycatch of salmon in non-salmon fisheries, and achieve adequate escapement of native runs to river systems, it is difficult to be overly optimistic about management's ability to achieve stated goals. Certainly it will require a significant change in the national and international commitment to salmon resource management.

Although this issue may not lend itself to any realistic quantitative interpretation, it should be discussed in some detail, since it will influence restoration opportunities. Furthermore, even if management goals are successful, the DEIS should clarify who receives the resulting benefits. After all, it is fairly clear from existing data that Elwha chinook and perhaps other species are subjected to significant Canadian fisheries. A more detailed discussion of wild stock restoration feasibility as it relates to management need is provided in a later section of this report.

We generally agree with the James River comments on the importance of using common criteria for the evaluation of the feasibility of restoration. Although cumbersome, the current DEIS classification process, supporting rationale, and databases can be understood sufficiently to enable NRC to critique its restoration conclusions. We have thus reviewed the species-by-species analysis in the DEIS and James River comments in developing our remarks and suggestions concerning restoration feasibility.

JR-245: The four criteria are suitable. The additional criteria is not needed for the evaluation. The ability to predict this factor meaningfully makes its use impractical. The staff does not believe extensive discussion of Pacific Salmon Treaty disputes are warranted in the EIS. The staff believes future detailed management of international stock harvest is out of the Commission's assessment of the EIS process and maintains that extensive discussion of possible management alternatives will not add to the decision-making process.

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EXHIBIT

Chinook

Passage Mortalities

The DEIS comments leading to restoration possibilities are flawed by the manner in which the perceived mortalities have been applied to various river area juvenile and adult populations. NRC re-evaluation of these data results in improved passages for the juvenile and adult populations, even accepting most of the DEIS estimated passage survival mortality factors. For chinook, using the James River passage mortality estimate in Lake Mills, which is more justifiable than the DEIS value, overall passage survival under spawning-limited conditions improves from the 62.5% stated in Appendix B of the DEIS to 76%. If habitat conditions in the Elwha are rearing-limited proportionally higher amounts of chinook are produced in the lower and middle reaches than if habitat is spawning-limited. This shift in the location of production increases overall survival to 80% under rearing-limited conditions.

Sustainable Exploitation Rates at MSY

JR-246 If the production curves are generated using the correct mortality coefficients, a significant improvement in chinook sustainable exploitation rates results. Under the dams-in scenario, the rate increases from 59% to 70%, a value within the range the DEIS considered reasonably possible under present management regimes. Thus, when considering sustainable exploitation rates, restoration possibilities are greatly improved over that presented in the DEIS.

The mortality adjustment would also alter the exploitation rate value for spring chinook, but probably not enough to warrant a change in restoration feasibility. The no-dams option restoration feasibility would be unchanged.

Habitat

We find no specific fault with the DEIS discussion of habitat.

Stock Selection and Availability

We have no particular quarrel with the DEIS and James River discussions of stock selection and availability. Both agree on the general availability of stocks to support fall chinook runs. Neither the James River nor DEIS reports notes, however, that restoration of the fall chinook population in the rivers--under both options--does not necessarily constitute restoration of the pre-dam Elwha genetic strain. Current Elwha chinook stocks to be used for river restoration may be significantly altered in genetic terms from that which existed

JR-246: The staff believes our passage survival factors and rating of restoration potential suitable. The staff's exploitation rates are suitable considering limitations of the information (see response JR-228). The staff has developed a restoration plan for dam removal (see Appendix A, Part 3.3). No substantial pink salmon numbers exist above lakes, which is suitable indication of unfavorable passage survival (see Section 4.1.3.2).

Efforts in the lower reach will not restore stocks to most of the potential habitat in the middle and upper reaches. Because about two-thirds of the habitat is unfavorable, an overall unfavorable assessment is warranted. While a lack of local stock restricts potential in the staff's view, it does not make the stock rating unfavorable. Other local stocks could be used for restoration.

Similar to pink salmon, lack of local river stocks does not make stock ratings unfavorable for chum. Runs can be produced without local stocks, although some increased risk occurs, as indicated by the "marginal" stock rating.

EXHIBIT

JR-246 cont'd

in the pre-dams era. There is also no in-depth exploration in the DEIS of the potential consequence of the dam removal process on the maintenance of the extant chinook (also steelhead and coho) Elwha stocks. Nor is there any plan to ensure adequate protection of these stocks in light of possible elimination of lower river spawning options or hatcheries during the dam removal and river restoration period. The questions raised by the James River comments in this regard need to be effectively addressed, and plans made for alternative stock enhancement facilities should the river and hatchery environments render their maintenance in the Elwha River unfeasible.

Coho

Passage Mortality and Allowable Harvest

Total passage mortality for coho is calculated at 27%, but is flawed, as we discussed earlier. Our calculated value, applying mortality values by stream section, is 20.8%, close to the percentage judged favorable for restoration by the DEIS. This increase in survival rate also leads to an increase in the potential exploitation rate from .52 to .58, if one uses 35.5 smolts per spawner, but not enough to alter the current DEIS restoration classification for the harvest of coho.

Habitat and Stock Availability

NRC has no comments on the DEIS and James River habitat restoration comments, nor on stock availability. Overall, however, the improved passage survival should improve the restoration potential for coho under the James River proposal. Note that as with chinook, the issue of coho stock maintenance during the period of restoration following dam removal must be addressed.

Winter Steelhead

Passage Mortality

Using DEIS values for passage mortality in Lake Mills and Lake Aldwell and through the dams, but segregating production (mortality) by stream reach, produces an estimate of passage mortality equal to 23%, 13% downstream and 10% upstream.[5] This mortality estimate is slightly lower than the 31% mortality estimate presented in the DEIS, but still within the range deemed marginally favorable for restoration.

[5] 10% total upstream mortality represents a 14% cumulative mortality of adults returning to the upper reach, 7.5% for those returning to the middle reach, and 0% for those spawning in the lower reach.

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EXHIBIT

JR-246 cont'd

Studies of chinook and coho survival through the Elwha Dam Eicher screen have recently been completed and have revealed that 95%-99% of juveniles survive Eicher screen passage. Because steelhead migrate at larger sizes than coho and chinook, Eicher passage for steelhead should be no lower than that for those two species. Incorporating a 99% survival rate into calculations of overall survival increases total survival to 78%--very near the value judged as favorable by the DEIS. It is our opinion that given an Eicher screen passage survival of 95% to 99%, passage conditions for steelhead should be judged favorable.

Sustainable Exploitation Rates at MSY

Our adjustments for differential passage mortality under the with-dams scenario increase the sustainable exploitation rate for steelhead to 32%, within the range denoted as reasonably possible. Given that all steelhead harvest occurs in-river, we assert that a steelhead exploitation rate of 32% is very possible under present and perceived future management regimes.

Allowable harvest, given a no-dams scenario, equals 43%. This exploitation exploitation rate is the same as the OER estimate for major western Washington rivers, as cited in the DEIS.

Habitat and Stock Availability

We agree that habitat and stock availability under the with-dams and without-dams scenarios would be favorable for steelhead. Attention should be paid to the fact that current wild stocks which spawn in the Elwha may not be representative of native Elwha wild stocks. Regardless of restoration feasibility, given passage, allowable harvest, and habitat conditions, eventual restoration results and associated production may be quite different than that associated with the native stock.

Pink

Passage

Given pink salmon life history characteristics, we concur with the DEIS and James River conclusions of poor passage survival of pink salmon juveniles originating from the middle reach. Since the steepness of the upper reach precludes pink salmon spawning (DEIS, pp. 3-39), this reach should be excluded from pink passage mortality and potential production estimates. Because no data are available to support the James River assumption of 20% survival through Lake Aldwell and the Elwha Dam, conclusions regarding the production potential of this reach are unwarranted.

JR-246 cont'd

Sustainable Exploitation Rate at MSY

The sustainable exploitation rates for pink salmon have not yet been calculated because adequate data are lacking. We disagree, however, with the DEIS assertion that poor passage survival necessarily leads to an unfavorable rating for allowable harvest. Lower reach production of pinks, if augmented by hatchery production, may be sufficient to support exploitation rates as high as 60%.

Habitat and Stock Availability

We agree that middle reach habitat for pink salmon is unfavorable but disagree that such a finding suggests that habitat quality for the river as a whole (lower and middle reaches) is also inferior. Using DEIS estimates of spawners per mile, the lower reach of the Elwha has the capacity to support large numbers of pink spawners, numbers that did occur in the lower reach prior to 1979. Overall river habitat should more correctly be labelled marginally favorable to favorable under a dam-retention scenario, and favorable given a dam-removal scenario.

The poor stock availability outlook for pink salmon makes other conclusions concerning passage, allowable harvest, and habitat moot. Without sufficient stock numbers, we judge restoration of Elwha pink salmon poor, regardless of the rating assigned to other factors or the dam-removal/dam-retention scenario eventually selected.

Chum

Because of the unfavorable outlook for chum stock availability (DEIS, pp. 4-103), it is our opinion that the restoration potential for this species is poor, with or without dams. Favorable or marginally favorable allowable harvest and habitat factors in both the dams-in or dams-out scenarios are irrelevant to the question of restoring Elwha River chum salmon, given the adverse stock availability situation. The sustainable exploitation rates for chum salmon have not yet been calculated because adequate data are lacking.

Sockeye

We agree with both the DEIS and James River reports that sockeye restoration potential is poor for either the dam-retention or dam-removal scenario.

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Other Species

JR-246 cont'd Although potential for successful restoration of wild stocks of Dolly Varden and cutthroat trout were originally included within the scope of work of this study, because adequate data were lacking, restoration of these species is not included in this report.

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MANAGING FOR ELWHA STOCK RESTORATION

Potential Harvest Levels

The DEIS and Natural Resources Consultants provide tables (DEIS Tables 4-14 and 4-21 and Table 8a and 8b of this document) which provide information on potential harvests at optimum escapement levels. All tables presume that the Elwha stocks can be managed in a manner to achieve the desired exploitation rates. Exploitation rates in excess of those noted will lead to stock depletion, and exploitation rates substantially under those required to achieve MSY will lead to excess spawning and subsequent
JR-247 declines in stock productivity, loss of potential yield, etc.

Although there are references to potential management needs during and subsequent to dam removals, the DEIS does not address quantitatively the short- or longer-term harvest restrictions that may be necessary to maintain the current spawning stocks during the dam removal and river restoration periods or during the period of rebuilding the wild stocks to MSY levels. Further, the DEIS does not discuss or provide any analysis of which fisheries are currently benefiting from Elwha fish production or are likely to be impacted by restoration of wild runs under the dams-in or dams-removed scenarios.

Present Fishery Interceptions of Elwha Stocks

In order to gain some insight into potential management actions required under the two scenarios under serious consideration, Natural Resources Consultants has examined the historical coded wire tag catch information for Elwha chinook and coho stocks.

JR-248 Results of this analysis for chinook (Tables 9a and 9b), show that for the 1981-1984 chinook brood years, 12% of the harvest of Elwha fish occurred in Alaskan fisheries, 49% in British Columbia fisheries, and 39% in the Oregon and Washington fisheries. The tables include an assumed incidental mortality of 33% of the landed catch for chinook salmon (adjusted for adult equivalence). These are fish that are killed in fisheries in which retention is not allowed, mortalities due to hook and release, and net drop-out loss. The U.S. sportfishery harvested 22% of the total Elwha harvest. (For details see Appendices IV and V.) It is notable that over 60% of the Elwha harvest occurs off British Columbia and Alaska.

JR-247: Comment noted. Such short- and long-term management activities are directed by the agencies and are continually changing. The level addressed in the EIS is adequate for the needs of this evaluation. The benefits of harvested stock were not a major criteria in the EIS evaluation and therefore do not need detailed analysis (see response JR-98).

JR-248: Comment noted. The staff incorporated the 64 percent harvest rate into the correct assessment.

EXHIBIT

Table 9a Harvest Distribution Pattern for Elwha Chinook Salmon
Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG.

Assumes 33% Incidental Mortality Loss (of Landed Catch)

Area	Fishery	Harvest in Numbers of Fish per 1,000 Adult Equivalent Mortality					
		Age 2	Age 3	Age 4	Age 5	Age 6	All Ages
Alaska	Troll	0.000	52.009	31.415	21.641	0.349	105.413
	Net	0.000	2.792	3.491	0.000	0.000	6.285
	Sport	0.000	1.396	0.349	0.000	0.000	1.745
	Alaska Subtotal	0.000	56.197	35.254	21.641	0.349	113.441
B.C.	N. B.C. Troll	0.000	9.424	14.660	2.443	0.000	26.528
	C. B. C. Troll	0.000	4.538	19.896	2.443	0.000	26.877
	WCVI Troll	0.000	72.602	110.998	12.916	0.000	196.516
	Geo St. Troll	0.000	0.000	2.094	0.000	0.000	2.094
	Troll Subtotal	0.000	86.564	147.648	17.801	0.000	252.014
	N. B. C. Net	11.519	17.802	2.792	0.000	0.000	32.113
	C. B. C. Net	4.189	20.594	1.047	0.000	0.000	25.830
	WCVI Net	3.141	9.075	2.443	1.745	0.000	16.405
	B.C. Juan Net	9.424	11.519	1.047	0.000	0.000	21.990
	JNST St. Net	6.283	0.349	1.047	0.000	0.000	7.679
	Net Subtotal	34.556	59.339	8.376	1.745	0.000	104.017
	N&C B.C. Sport	0.000	0.349	8.726	0.000	0.000	9.073
	WCVI Sport	2.792	17.108	10.122	0.000	0.000	30.018
	Geo St. Sport	3.491	41.537	29.320	3.840	0.000	78.187
	Subtotal Sport	6.283	58.989	48.168	3.840	0.000	117.278
	Subtotal B.C.	40.839	204.893	204.194	23.386	0.000	473.312
Wa/Or	Ocean Troll	0.000	2.094	30.367	1.396	0.000	33.858
	N Pug S. Net	2.094	11.519	30.716	17.453	1.745	63.527
	Oth Pug S. Net	5.236	27.226	34.905	1.396	0.000	68.763
	Wa Coastal Net	0.000	0.000	0.000	0.000	0.000	0.000
	Net Subtotal	7.330	38.745	65.621	18.849	1.745	132.290
	Ocean Sport	0.000	0.698	0.000	0.000	0.000	0.698
	N Pug. S. Sport	0.000	28.971	54.801	33.509	6.283	123.564
	Oth Pug S. Sport	5.934	51.310	22.339	3.141	0.000	82.725
	Subtotal Sport	5.934	80.979	77.140	36.650	6.283	206.987
	Subtotal Wa/Or	13.264	121.819	173.129	56.895	8.028	373.135
Elwha	Terminal Net	0.000	1.130	0.000	0.000	0.000	1.130
	Terminal Sport	0.000	0.000	0.000	0.000	0.000	0.000
	Terminal Subtotal	0.000	1.130	0.000	0.000	0.000	1.130
	Grand Total	84.103	384.304	412.878	101.923	8.377	961.285
	Troll	0.000	140.667	209.430	40.838	0.349	391.285
	Net	41.886	100.876	77.488	20.594	1.745	242.592
	Sport	12.217	141.364	125.657	40.490	6.283	326.010
	Terminal	0.000	1.130	0.000	0.000	0.000	1.130

Table 9b: Harvest Distribution Pattern for Elwha Chinook Salmon
Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG

Assumes 33% Incidental Mortality Loss (of Landed Catch)

Area	Fishery	Percent of Adult Equivalent Harvest Mortality					
		Age 2	Age 3	Age 4	Age 5	Age 6	All Ages
Alaska	Troll	0.00%	5.41%	3.27%	2.25%	0.04%	10.97%
	Net	0.00%	0.29%	0.36%	0.00%	0.00%	0.65%
	Sport	0.00%	0.15%	0.04%	0.00%	0.00%	0.18%
	Alaska Subtotal	0.00%	5.85%	3.67%	2.25%	0.04%	11.80%
B.C.	N. B C. Troll	0.00%	0.98%	1.53%	0.25%	0.00%	2.76%
	C. B. C. Troll	0.00%	0.47%	2.07%	0.25%	0.00%	2.80%
	WCVI Troll	0.00%	7.55%	11.55%	1.34%	0.00%	20.44%
	Geo St. Troll	0.00%	0.00%	0.22%	0.00%	0.00%	0.22%
	Troll Subtotal	0.00%	9.01%	15.36%	1.85%	0.00%	26.22%
	N. B. C. Net	1.20%	1.85%	0.29%	0.00%	0.00%	3.34%
	C. B. C. Net	0.44%	2.14%	0.11%	0.00%	0.00%	2.69%
	WCVI Net	0.33%	0.94%	0.25%	0.18%	0.00%	1.71%
	B.C. Juan Net	0.98%	1.20%	0.11%	0.00%	0.00%	2.29%
	JNST St. Net	0.65%	0.04%	0.11%	0.00%	0.00%	0.80%
	Net Subtotal	3.59%	6.17%	0.87%	0.18%	0.00%	10.82%
	N&C B.C. Sport	0.00%	0.04%	0.91%	0.00%	0.00%	0.94%
	WCVI Sport	0.29%	1.78%	1.05%	0.00%	0.00%	3.12%
	Geo St. Sport	0.36%	4.32%	3.05%	0.40%	0.00%	8.13%
	Subtotal Sport	0.65%	6.14%	5.01%	0.40%	0.00%	12.20%
	Subtotal B.C.	4.25%	21.31%	21.24%	2.43%	0.00%	49.24%
Wa/Or	Ocean Troll	0.00%	0.22%	3.16%	0.15%	0.00%	3.52%
	N Pug S. Net	0.22%	1.20%	3.20%	1.82%	0.18%	6.61%
	Oth Pug S. Net	0.54%	2.83%	3.63%	0.15%	0.00%	7.15%
	Wa Coastal Net	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Net Subtotal	0.76%	4.03%	6.83%	1.96%	0.18%	13.76%
	Ocean Sport	0.00%	0.07%	0.00%	0.00%	0.00%	0.07%
	N Pug S. Sport	0.00%	3.01%	5.70%	3.49%	0.65%	12.85%
	Oth Pug S. Sport	0.62%	5.34%	2.32%	0.33%	0.00%	8.61%
	Subtotal Sport	0.62%	8.42%	8.02%	3.81%	0.65%	21.53%
	Subtotal Wa/Or	1.38%	12.67%	18.01%	5.92%	0.84%	38.82%
Elwha	Terminal Net	0.00%	0.12%	0.00%	0.00%	0.00%	0.12%
	Terminal Sport	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Terminal Subtotal	0.00%	0.12%	0.00%	0.00%	0.00%	0.12%
	Grand Total	5.63%	39.98%	42.92%	10.60%	0.87%	100.00%
	Troll	0.00%	14.63%	21.79%	4.25%	0.04%	40.70%
	Net	4.36%	10.49%	8.06%	2.14%	0.18%	25.24%
	Sport	1.27%	14.71%	13.07%	4.21%	0.65%	33.91%
	Terminal	0.00%	0.12%	0.00%	0.00%	0.00%	0.12%

EXHIBIT

The overall (adult equivalent) exploitation rate based on the CWT recoveries for the Elwha chinook (1981-1986 brood years) was only 64%.

JR-248 cont'd

For Elwha coho (Table 10), 1% of the CWT receivers occurred in Alaskan fisheries, 51% occurred off Canada, 3% off Oregon, and 45% off Washington. U.S. sportfisheries harvested about 3% of the total Elwha coho harvest. The estimated exploitation rate (catch plus incidental fish catch) for coho ranged from 83% for the 1985 brood year to 92% for the 1986 brood year, a much higher exploitation rate than can be sustained by wild coho runs.

Overall Management Implications

JR-249

There are several management implications of the fishery interception results. First, under the fishery patterns which prevailed during the early 1980s, Elwha chinook were not being harvested at the desired exploitation rate to achieve MSY (.8 for DEIS, .78 for NRC study). Thus, presuming the chinook run is restored to projected potentials, increases in the exploitation rate would be permissible, probably in the terminal fishery. Second, it is clear that existing fishing rate on coho (83%-92%, using CWT data), cannot be sustained under either the dams-in or dams-removed scenarios, and that considerable reductions in fishing will be necessary. Third, these exploitation rate observations do not take into account that some further management actions may be necessary to protect Elwha salmon stocks during stock maintenance and restoration periods, again for both scenarios, but in particular if the dams are removed.

Salmon Management Arenas

JR-250

Options for providing management actions to reduce harvest on both chinook and coho range from those available exclusively to the State of Washington (WDF and WDG) and Indian tribes, cooperative management arrangements among state (Oregon, Washington, Alaska) and federal agencies, and those that might be achieved within the context of international arrangements (U.S./Canada salmon treaty). The CWT data show that a significant share of the harvest of both chinook and coho occur in Canadian fisheries. Elwha management objectives related to British Columbia fisheries must be manifested within the U.S./Canada Salmon Commission. Further, for chinook, the Alaskan salmon net and troll fisheries are an important element of the harvest equation which involves the State of Alaska fishery (ADF&G), as well as the North Pacific Fishery Management Council (NPFMC) for offshore troll fisheries. Finally, the nature of Washington and Oregon offshore intercepting salmon fisheries involves management action which must be taken by the Pacific Fishery Management Council (PFMC).

JR-249: The staff has addressed suitable levels of harvest management into Fisheries and Socioeconomics of Sections 4.1 and 4.2.

JR-250: Comment noted. There are and will always be some unknowns of future activity.

EXHIBIT

Table 10: Harvest Distribution Pattern for Elwha Coho Salmon
Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG.

Assumes 3.6% Incidental Mortality Rate (of Landed Catch)

Area	Fishery	Harvest in # Fish per 1,000 Adult Equivalent	Percent Harvest
Alaska	SE Troll	6.90	0.72%
B.C.	N B.C. Troll	8.30	0.86%
	SC B.C. Troll	5.80	0.60%
	NW Van Troll	109.30	11.34%
	SW Van Troll	249.40	25.87%
	Troll Subtotal	372.80	38.67%
	SW Van Net	13.60	1.41%
	JNST St. Net	1.80	0.19%
	B.C. Juan Net	25.00	2.59%
	Net Subtotal	40.40	4.19%
	WC Van Sport	0.90	0.09%
	Geo St. Sport	73.80	7.66%
	Sport Subtotal	74.70	7.75%
	B.C. Subtotal	487.90	50.61%
Oregon	Troll	26.20	2.72%
	Sport	6.40	0.66%
	Oregon Subtotal	32.60	3.38%
Washington	Ilwaco Troll	1.30	0.13%
	Neah Bay Troll	39.30	4.08%
	Troll Subtotal	40.60	4.21%
	Grays Har Net	0.40	0.04%
	US Juan Net	45.40	4.71%
	Oth Puget Net	36.70	3.81%
	Subtotal Net	82.50	8.56%
	Grays Har Sport	0.20	0.02%
	La Push Sport	0.20	0.02%
	Neah Bay Sport	3.60	0.37%
	US Juan Sport	26.40	2.74%
	Sport Subtotal	30.40	3.15%
	Wa Subtotal	153.50	15.92%
	Elwha River Net	283.10	29.37%
	Grand Total	964.00	100.00%
	Troll	446.50	46.32%
	Net	122.90	12.75%
	Sport	111.50	11.57%
	Terminal Net	283.10	29.37%

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JR-250 cont'd Of additional concern is the fact that the fishery interceptions of Elwha chinook are based on coded wire tags released from Elwha hatchery stocks. These data may not reflect the interception rates for a wild Elwha chinook stock. Wild Elwha chinook might, for example, migrate farther north than hatchery chinook. Thus, wild chinook possibly could be more susceptible to Alaskan and northern British Columbia fisheries where present interception rates are already high.

Opportunities for Chinook Management

JR-251 Commercial net fishery interceptions of Elwha chinook salmon are mainly as bycatch in directed fisheries on other salmon species and offer little in the way of management options for reduced harvest. The recent success of the Southeastern Alaskan chinook hatchery program has prompted a request by Alaska for increased troll and net quotas for chinook. In the British Columbia troll fishery, most Elwha chinook salmon are harvested in the West Coast Vancouver Island troll fishery which is a powerful group in Canadian fishery politics and is unlikely to reduce current exploitation rates for the sake of Elwha salmon. Not to be overlooked is the significant growth in recent years in the chinook sport fishery off of the southwest end of Vancouver Island. Although this fishery may intercept additional Elwha chinook, CWT data may not yet adequately detect and account for it because the fishery is a relatively recent phenomenon.

Sportfishing interceptions of Elwha chinook are mainly from northern Puget Sound fisheries, which includes the Strait of Juan de Fuca. These fisheries have recently had relatively severe restrictions in order to protect other chinook and coho stocks and may offer some potential for chinook harvest reduction if required during restoration.

Opportunities for Coho Management

Since reductions in exploitation rates involve complicated interactions between state agencies, tribes, federal management entities, and an international organization, all concerned with fisheries of mixed origins, such reductions have not been easily achieved for coho or chinook salmon.

JR-252 Coho salmon interceptions in British Columbia troll fisheries are unlikely to be affected by management action unless an overall reduction in the troll exploitation rate results from U.S./Canada treaty negotiations. NRC believes this is unlikely to occur under present international policies. The British Columbia government is expected to implement a native coho protection program that could result in a reduction of harvest of wild coho in the Georgia Strait sportfishery under a tag-catch-and-release program. Although this fishery presently accounts for about 8% of the harvest of Elwha coho, it is unlikely that a reduction of more than 1% could be

JR-251: In the staff's view, future predictions of detailed fisheries changes cannot be determined.

JR-252: Detailed prediction of what will or can be done for management depends on too many factors to make any detailed predictions.

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expected if the Canadian plan is implemented. Contributions to Elwha coho restoration would be limited.

JR-252 cont'd

Oregon and Washington interceptions of Elwha coho are, for the most part, relatively minor harvests in mixed stock fisheries and offer little, if any, management options to reduce exploitation rates on Elwha coho. Only the Indian terminal net fishery (29% of the total Elwha coho harvest) for Elwha coho offers a viable means of reducing the exploitation rate on Elwha coho via harvest management.

Under conditions where harvests are controlled by quota regulations, an alternative method of reducing the exploitation rate on Elwha stocks would be to increase the number of fish available for harvest in the marine environment by a coordinated increase in hatchery production from Oregon, Washington, British Columbia, and Alaska. Under the present policies and budget constraints, this, however, is unlikely in the near future.

JR-253

Short- and Long-Term Management Options

Natural Resources Consultants sees a number of short- or long-term management issues that require attention and potential contingency plans under the two scenarios to ensure that (1) the current genetic stock units are protected and available for restoration (dams out), (2) exploitation rates are reduced on coho (dams in or out), and (3) there is a reasonable capacity for the current stock to rebuild the up-river runs.

To evaluate the proposed scenarios properly, the DEIS should fully address the consequences of management actions required to restore wild Elwha stocks. We have addressed each of these concerns in a somewhat cursory fashion, but we feel the DEIS should provide more definite plans to address these matters.

Short-Term Management Implications

During and following dam removals, some management action will most likely be necessary to reduce interception of Elwha chinook and coho. Assuming, as implied in the DEIS, that the WDF rearing channels no longer function to support stock maintenance and increase run sizes during and shortly following dam removals and that hatchery operations are impaired by dam removal, the continuity of chinook, coho, and steelhead runs would presumably become largely dependent on wild production.

If this were to occur in the period of dam removal and shortly thereafter, the largely hatchery-driven Elwha runs must adapt as wild stocks and provide for future spawning escapement. The overall productivity of the various species and stocks may well be impacted by a greatly altered river

JR-253: The staff has included a more detailed assessment of impacts from dam removal (see Section 4.2.3) and developed a restoration plan that includes hatchery supplementation (Appendix A, Part 3.3). The effects on harvest were addressed sufficiently in Section 4.2.8. See response JR-228 for potential production estimates, and responses JR-251 and JR-252 for future management predictions. Other comments noted.

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environment which most likely will reduce the natural rate of stock increase (decreasing the Ricker "a" value) and thus reducing the levels of harvest the stocks can withstand.

At a minimum, the exploitation rate of coho must decline from the perceived current harvest level of 90% to 65%. This reduction is mandated by the switch over from hatchery to wild stock and the need for a greater number of spawners during restoration. A further reduction in the exploitation rates over the short run may also be necessary to overcome reduced stock productivity and the inability of the wild coho escapement to effectively utilize the optimum river spawning habitat.

JR-253 cont'd

Shifting to a wild coho run of 16,327 fish at MSY will require a reduction from the current 90% exploitation rate to a rate of 65%. Under the NRC coho evaluation for dam removal, this requires a future reduction in catch of 4,080 adult cohos (7,142 harvested with dam removal and a 90% exploitation minus 3,062 harvested with dam removal and a 65% exploitation rate). If no future reduction in the exploitation rate can be achieved in the British Columbia interceptions, then the U.S. Elwha catch must be reduced by about 57% of the catch taken at the 0.9 exploitation rate (7,142 fish). Thus, instead of receiving an expected harvest of about 5,307 (approximately one-half the MSY at the .65 exploitation rate under dam removal), the U.S. harvest would be cut to about 3,062 fish. Unless U.S. mixed fisheries are significantly reduced, the only remaining management action would be to terminate or reduce the in-river fishery. The consequence of this management action is shown in Table 16.

The implication of a reduction in exploitation rate is even more severe in the dams-in scenario in that the Elwha in-river fishery closure is inadequate to reduce the cumulative exploitation rate from 90% to 58%. Hence, a restriction on mixed fisheries with associated economic consequences for sport and commercial fisheries would be required.

Under the dams-removed option, the minimum annual loss to U.S. fishermen resulting from the management action would be 48,418 pounds of coho, worth $133,600[6] Under the dams-in option, the loss would approach 58,023 lb annually, or $113,345.[7]

Both of these scenarios, of course, deal only with the management actions required to maintain the coho stocks at the stated exploitation rates of .65 and .58, dams out and dams in, respectively. They do not deal with the potential need to adjust these exploitation rates downward for short-term reductions in coho stock productivity. If, for example, the shift to wild stock management requires an additional reduction in the exploitation rate (e.g.,

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[6]This number combines sport and commercial values.

[7]This number combines sport and commercial values but does not include potential losses in mixed fisheries that would be closed.

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down another .15) to accommodate reduced productivity resulting from environmental degradation and if no relief help could be anticipated from a reduction in British Columbia fisheries, then all U.S. coho fisheries involving any substantial Elwha fish interceptions would have to be closed to provide the protection desired. This is an unlikely scenario.

We have considered the short-term coho management options as requiring unilateral (U.S.) or even State of Washington actions. Although some reduction in coho interception might be negotiated with Canada, it seems unlikely that Canada will take short-term action which would meet anticipated Elwha management needs. Further, although the tribes may be willing to sacrifice the in-river coho fishery to achieve the longer-term gains which they might derive from increased chinook production, further reductions in U.S. harvest which would involve significant cuts in U.S. mixed stock fisheries may be politically unattainable.

JR-253 cont'd

The potential inability to control short-term coho harvests to reasonable levels over the decade following dam removals could jeopardize maintenance of an adequate spawning stock needed for long-term restoration. This rekindles the question of how and where the coho stock will be maintained during the critical dam removal period. From NRC's perspective, although we clearly understand the National Park Service's, Indians' and others' reluctance to rely on hatchery production, for the long term there is nevertheless a need to directly address or clarify how the hatchery facility will be utilized during the period of dam removal and environmental restoration of the river. The hatchery could provide a safety valve to ensure stock continuity and to accelerate rebuilding of the upriver runs if the spawning channels and hatchery can remain functional after dam removal. Protection against genetic drift, etc., could be addressed after wild spawning becomes prevalent by careful selecting against second generation hatchery-reared fish. In as much as continued stock maintenance of chinook, coho, and steelhead might be jeopardized by environmental degradation caused by the dam removals, alternative plans should be available. Finally, regarding this matter we see no evidence in the dams-out scenario of a funding mechanism to operate the hatchery and/or a plan coupled with restoration of the wild runs.

Fortunately, the Elwha chinook stock has not been intensively exploited, and there is a greater margin of security for this species. Current Elwha chinook exploitation rates, although estimated at .8 by the DEIS, seem to be about .64. and assuming the Ricker "a" values used by the DEIS, James River, and NRC are correct, then no significant long-term management actions are foreseen to harvest at MSY levels. Further, since current harvest levels are relatively low, they provide some hedge against potential reductions in chinook productivity resulting from limited environmental degradation.

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Nevertheless, any significant decline in Elwha productivity resulting from the shift to exclusive wild stock production could require employment of more restrictive harvest actions. With somewhat limited U.S. capacity to respond, Elwha restoration might be further jeopardized. In this sense the comments regarding hatchery support to maintain these stocks or an alternate plans are again appropriate. On the Yakima River, a wild stock rebuilding program includes hatchery production to augment wild production, accelerating restoration and providing a buffer for variations in environmental effects on natural production.

For steelhead, in-river harvest by Indian and sport anglers could be eliminated over the short term, providing some protection against reduced stock productivity. Again, however, the further selective use of hatcheries should be considered in the short term.

Long-Term Management Implications

JR-253 cont'd

The longer-term management needs for Elwha salmon species differ only in respect to an anticipated gradual improvement in the river environment which would allow chinook, coho, and steelhead populations to produce projected maximum sustainable yields (MSY) and in the management needs for chum and pink salmon. Although these latter species should provide an overall increase in fishing opportunities, management of the Elwha stocks would most likely be subordinate to achieving other Northern Puget Sound management goals involved in U.S./Canada treaty arrangements. Thus, it is difficult to speculate on specific arrangements that might be needed to rebuild Elwha pink and chum stocks, even assuming the availability of suitable stocks for restoration. It is possible that in some areas and during some time periods specific management arrangements could be developed which would not require reductions in adjacent mixed stock fisheries. Sorting out management plans for chum and pink salmon will require some understanding of these migratory patterns and holding behavior in and around the Elwha entrance.

For coho salmon, the short-term management need to reduce exploitation rates down to at least .65 will continue in the foreseeable future. It is possible over the longer term that the burden of reducing the current exploitation rate down from .90 to .65 would ultimately be shared by some reduction in the Canadian fishery. If not, then the projected economic loss noted for the short-term would continue, resulting in little of the overall benefits accruing to Washington-based sport, tribal, or non-tribal commercial fishing.

The long-term management need and U.S. benefits of the projected increase in chinook landings are more optimistic. Because of the current low exploitation rate (.65) and generally higher productivity of the chinook run which could sustain harvest approaching .8, U.S. fisheries should have the opportunity to increase harvest. However, it may be difficult to

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pass the benefits on to the mixed stock net, troll, and sports fisheries because of conservation regimes in place to control exploitation rates of chinook designated for other river systems. The management entities involved may find it more convenient to allow the excess harvest to be taken in the Indian terminal river fishery.

For both chinook and coho, the longer-term management needs of the Elwha may benefit from conservation implemented in Canada to protect British Columbia stocks. It is, however, premature and speculative to expect short- and perhaps long-term gains based on this possibility. Thus, the short-term cost noted above required to maintain coho would continue into the future.

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Summary of Management Option Implications

Tables 11-16 provide catch details for U.S. and Canadian fisheries under the current, dam-with-passage-facilities, and dams-removed options. A comparison of current and future expected coho and chinook MSY values, escapement, percentage of the total Elwha harvest taken by U.S. fishermen, and the weight of catch taken by U.S. fishermen, based on the current Elwha fisheries and future fisheries, under the assumption that the dams remain in or are removed is made in Table 17. For coho management, restrictions have been put in place to reduce exploitation levels to .58 (dams in) and .65 (dams removed). For chinook, most of the increased catch is assumed to occur in the terminal net fishery.

For coho, the present situation provides considerably greater benefits to U.S. interests than either the dams-in or dams-removed options because of the need to curtail U.S. fisheries and the expected decrease in MSY. By contrast, chinook catches improve under both future options, particularly in the dams-out scenario.

It is important to note when reviewing Tables 11 - 16 that exploitation rates vary according to the river management scenario and harvest conditions under investigation. Present conditions (i.e., dams-in and harvest as-is) are described in Tables 11 and 14 and use historical exploitation rates of 0.74 for chinook and 0.90 for coho. Chinook harvests associated with dams-in and dams-removed scenarios are presented in Tables 12 and 13. No harvest restrictions are necessary to achieve MSY-level exploitation rates (68% for dams-in and 78% for dams-removed) and excess chinook are available for the Elwha terminal net fishery under both scenarios. Chinook harvest at

JR-254: The staff disagrees with total quantity of fish used (see response JR-228). The staff incorporated existing average harvest rates and incidental mortality rates as determined by Dr. Morishima in your document. Also, the staff obtained a different allowable exploitation rate with dams in place (see Socioeconomics, Sections 4.1.8 and 4.2.8).

the terminal fishery, however, will be higher under the dams-removed scenario (3,610 fish) than associated with the dams-in scenario (542 fish).[8]

JR-254 cont'd

Coho are a different story and their harvest patterns with and without dams are depicted in Tables 15 and 16. Coho exploitation rates are presently at 90% (see Table 14). This rate of exploitation is higher than what is apppropriate for MSY-level harvests (a 65% exploitation rate is appropriate under a dams-removed scenario; 58% is necessary to achieve MSY with the dams still in place). Table 15 shows that the closure of the terminal net fishery is insufficient to meet the goals of MSY-level harvests with dams-in. Further closures totalling 760 fish are necessary to reach the target exploitation rate of 58%. Closure of the terminal net fishery is sufficient to achieve coho exploitation rate goals when the dams are removed (Table 16). Exploitation rates drop from the current 90% to the MSY target of 65%. As this complete closure of the terminal fishery leaves 227 coho unharvested, some partail closure is perhaps more appropriate.

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[8] Total mortality reflects a combination of a number of induced mortalities, including passage losses and harvest. Given an acceptable level of mortality associated with MSY, decreases in one mortality factor can be supplanted by increases in another, assuming all else is equal. Reductions in passage mortalities associated with dam removal can then be offset by increases in harvest mortalities without exceeding the level of total mortality or exploitation appropriate for MSY.

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Table 11. Harvest distribution pattern for Elwha Chinook salmon under present condition. Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG.

Present Condition
Assumes 33% Incidental Mortality Rate (of Landed Catch) — Harvest: 9,613 — Incidental Mortality: 387 — Overall Exploitation Rate: 64%
MSY Goal: 10,000 [See Note]
Available/(Over) Harvest (#s): 0 (lbs): 0

Area	Fishery	Age 2	Age 3	Age 4	Age 5	Age 6	All Ages	Weight (lbs)	Percent By Weight
		Harvest in Numbers of Fish (Adult Equivalent)							
Alaska	Troll	0.0	520.1	314.2	216.4	3.5	1,054.1	15,253	12.9%
	Net	0.0	27.9	34.9	0.0	0.0	62.9	671	0.6%
	Sport	0.0	14.0	3.5	0.0	0.0	17.5	186	0.2%
	Alaska Subtotal	0.0	562.0	352.5	216.4	3.5	1,134.4	16,109	13.6%
B.C.	N. B.C. Troll	0.0	94.2	146.6	24.4	0.0	265.3	4,322	3.7%
	C. B. C. Troll	0.0	45.4	199.0	24.4	0.0	268.8	2,964	2.5%
	WCVI Troll	0.0	726.0	1,110.0	129.2	0.0	1,965.2	26,140	22.1%
	Geo St. Troll	0.0	0.0	20.9	0.0	0.0	20.9	231	0.2%
	Troll Subtotal	0.0	865.6	1,476.5	178.0	0.0	2,520.1	33,656	28.4%
	N. B. C. Net	115.2	178.0	27.9	0.0	0.0	321.1	1,631	1.4%
	C. B. C. Net	41.9	205.9	10.5	0.0	0.0	258.3	1,284	1.1%
	WCVI Net	31.4	90.8	24.4	17.5	0.0	164.1	762	0.6%
	B.C. Juan Net	94.2	115.2	10.5	0.0	0.0	219.9	810	0.7%
	JNST St. Net	62.8	3.6	10.5	0.0	0.0	76.9	277	0.2%
	Net Subtotal	345.6	593.4	83.8	17.5	0.0	1,040.2	4,765	4.0%
	N&C B.C. Sport	0.0	3.5	87.3	0.0	0.0	90.7	1,000	0.8%
	WCVI Sport	27.9	171.0	101.2	0.0	0.0	300.2	3,993	3.4%
	Geo St. Sport	34.9	415.4	293.2	38.4	0.0	781.9	8,621	7.3%
	Subtotal Sport	62.8	589.9	481.7	38.4	0.0	1,172.8	13,615	11.5%
	Subtotal B.C.	408.4	2,048.9	2,041.9	233.9	0.0	4,733.1	52,035	44.0%
Wa/OrOcean Troll		0.0	20.9	303.7	14.0	0.0	338.6	2,900	2.5%
	N Pug S. Net	20.9	115.2	307.2	174.5	17.5	635.3	10,594	9.0%
	Oth Pug S Net	52.4	272.3	349.1	14.0	0.0	687.6	5,149	4.4%
	Wa Coastal Net	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0%
	Net Subtotal	73.3	387.5	656.2	188.5	17.5	1,322.9	15,743	13.3%
	Ocean Sport	0.0	7.0	0.0	0.0	0.0	7.0	73	0.1%
	N Pug. S. Sport	0.0	289.7	548.0	335.1	62.8	1,235.6	26,098	22.1%
	Oth Pug. S Sport	59.3	513.1	223.4	31.4	0.0	827.3	5,102	4.3%
	Subtotal Sport	59.3	809.8	771.4	366.5	62.8	2,069.9	31,273	26.4%
	Subtotal Wa/Or	132.6	1,218.2	1,731.3	569.0	80.3	3,731.4	49,915	42.2%
Elwha	Terminal Net	0.0	11.3	0.0	0.0	0.0	11.3	254	0.2%
	Terminal Sport	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0%
	Terminal Subtotal	0.0	11.3	0.0	0.0	0.0	11.3	254	0.2%
	Grand Total	541.0	3,843.0	4,125.8	1,019.2	83.8	9,612.9	118,314	100.0%
	Troll	0.0	1,406.7	2,094.3	408.4	3.5	3,912.8	51,808	43.8%
	Net	418.9	1,008.8	774.9	205.9	17.5	2,425.9	21,178	17.9%
	Sport	122.2	1,413.6	1,256.6	404.9	62.8	3,260.1	45,074	38.1%
	Terminal	0.0	11.3	0.0	0.0	0.0	11.3	254	0.2%

*Note that the harvest values shown in the DEIS and used in this table (10,000) constitute a 0.74 exploitation
If the higher exploitation rate (0.8) is used, an additional 800 fish would be harvested and distributed proportionately.

Table 12. Harvest distribution pattern for Elwha chinook salmon with dams-in and no harvest restrictions. Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG.

Dams In (No Harvest Restriction)
Assumes 33% Incidental Mortality Rate (of Landed Catch) — Harvest: 8,673 — Incidental Mortality: 371 — Overall Exploitation Rate: 68%
MSY Goal: 9,587
Available/(Over) Harvest (#s): 542 (lbs): 12,195

Area	Fishery	Age 2	Age 3	Age 4	Age 5	Age 6	All Ages	Weight (lbs)	Percent By Weight
		Harvest in Numbers of Fish (Adult Equivalent)							
Alaska	Troll	0.0	469.3	283.4	195.3	3.1	951.1	13,762	12.9%
	Net	0.0	25.2	31.5	0.0	0.0	56.7	605	0.6%
	Sport	0.0	12.6	3.1	0.0	0.0	15.7	168	0.2%
	Alaska Subtotal	0.0	507.0	318.1	195.3	3.1	1,023.5	14,535	13.6%
B.C.	N. B.C. Troll	0.0	85.0	132.3	22.0	0.0	239.4	3,899	3.7%
	C. B. C. Troll	0.0	40.9	179.5	22.0	0.0	242.5	2,674	2.5%
	WCVI Troll	0.0	655.1	1,001.5	116.5	0.0	1,773.1	23,585	22.1%
	Geo St. Troll	0.0	0.0	18.9	0.0	0.0	18.9	208	0.2%
	Troll Subtotal	0.0	781.0	1,332.2	160.6	0.0	2,273.9	30,367	28.4%
	N. B. C. Net	103.9	160.6	25.2	0.0	0.0	289.7	1,472	1.4%
	C. B. C. Net	37.8	185.8	9.4	0.0	0.0	233.1	1,159	1.1%
	WCVI Net	28.3	81.9	22.0	15.7	0.0	148.0	688	0.6%
	B.C. Juan Net	85.0	103.9	9.4	0.0	0.0	198.4	731	0.7%
	JNST St. Net	56.7	3.1	9.4	0.0	0.0	69.3	250	0.2%
	Net Subtotal	311.8	535.4	75.6	15.7	0.0	938.5	4,299	4.0%
	N&C B.C. Sport	0.0	3.1	78.7	0.0	0.0	81.9	903	0.8%
	WCVI Sport	25.2	154.3	91.3	0.0	0.0	270.8	3,603	3.4%
	Geo St. Sport	31.5	374.8	264.5	34.6	0.0	705.5	7,779	7.3%
	Subtotal Sport	56.7	532.2	434.6	34.6	0.0	1,058.2	12,284	11.5%
	Subtotal B.C.	368.5	1,848.7	1,842.4	211.0	0.0	4,270.6	46,950	44.0%
Wa/OrOcean Troll		0.0	18.9	274.0	12.6	0.0	305.5	2,616	2.5%
	N Pug S. Net	18.9	103.9	277.1	157.5	15.7	573.2	9,559	9.0%
	Oth Pug S. Net	47.2	245.7	314.9	12.6	0.0	620.4	4,646	4.4%
	Wa Coastal Net	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0%
	Net Subtotal	66.1	349.6	592.1	170.1	15.7	1,193.6	14,204	13.3%
	Ocean Sport	0.0	6.3	0.0	0.0	0.0	6.3	68	0.1%
	N Pug. S. Sport	0.0	261.4	494.5	302.3	56.7	1,114.9	23,547	22.1%
	Oth Pug. S Sport	53.5	463.0	201.6	28.3	0.0	746.4	4,604	4.3%
	Subtotal Sport	53.5	730.7	696.0	330.7	56.7	1,867.6	28,217	26.4%
	Subtotal Wa/Or	119.7	1,099.1	1,562.1	513.3	72.4	3,366.7	45,037	42.2%
Elwha	Terminal Net	0.0	10.2	0.0	0.0	0.0	10.2	229	0.2%
	Terminal Sport	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0%
	Terminal Subtotal	0.0	10.2	0.0	0.0	0.0	10.2	229	0.2%
	Grand Total	488.2	3,467.5	3,722.6	919.6	75.6	8,673.4	106,752	100.0%
	Troll	0.0	1,269.2	1,889.6	368.5	3.1	3,530.5	46,745	43.8%
	Net	377.9	910.2	699.2	185.8	15.7	2,188.8	19,108	17.9%
	Sport	110.2	1,275.5	1,133.8	365.3	56.7	2,941.5	40,669	38.1%
	Terminal	0.0	10.2	0.0	0.0	0.0	10.2	229	0.2%

Table 13. Harvest distribution pattern for Elwha chinook salmon with dams removed and no harvest restrictions. Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG.

Dams Out (No Harvest Restriction)
Assumes 33% Incidental Mortality Rate (of Landed Catch) Available/(Over) Harvest
Harvest: 16,589 Incidental Mortality: 814 MSY Goal: 21,013 (#s): 3,610
Overall Exploitation Rate: 78% (lbs): 81,186

Area	Fishery	Harvest in Numbers of Fish (Adult Equivalent) Age 2	Age 3	Age 4	Age 5	Age 6	All Ages	Weight (lbs)	Percent By Weight
Alaska	Troll	0.0	897.6	542.1	373.5	6.0	1,819.2	26,323	12.9%
	Net	0.0	48.2	60.2	0.0	0.0	108.5	1,157	0.6%
	Sport	0.0	24.1	6.0	0.0	0.0	30.1	321	0.2%
	Alaska Subtotal	0.0	969.9	608.4	373.5	6.0	1,957.7	27,801	13.6%
B.C.	N. B.C. Troll	0.0	162.6	253.0	42.2	0.0	457.8	7,458	3.7%
	C. B. C. Troll	0.0	78.3	343.4	42.2	0.0	463.9	5,115	2.5%
	WCVI Troll	0.0	1,252.9	1,915.6	222.9	0.0	3,391.4	45,111	22.1%
	Geo St. Troll	0.0	0.0	36.1	0.0	0.0	36.1	398	0.2%
	Troll Subtotal	0.0	1,493.9	2,548.1	307.2	0.0	4,349.2	58,082	28.4%
	N. B. C. Net	198.8	307.2	48.2	0.0	0.0	554.2	2,815	1.4%
	C. B. C. Net	72.3	355.4	18.1	0.0	0.0	445.8	2,216	1.1%
	WCVI Net	54.2	156.6	42.2	30.1	0.0	283.1	1,316	0.6%
	B.C. Juan Net	162.6	198.8	18.1	0.0	0.0	379.5	1,398	0.7%
	JNST St. Net	108.4	6.0	18.1	0.0	0.0	132.5	478	0.2%
	Net Subtotal	596.4	1,024.0	144.5	30.1	0.0	1,795.1	8,223	4.0%
	N&C B.C. Sport	0.0	6.0	150.6	0.0	0.0	156.6	1,727	0.8%
	WCVI Sport	48.2	295.2	174.7	0.0	0.0	518.0	6,891	3.4%
	Geo St. Sport	60.2	716.8	506.0	66.3	0.0	1,349.3	14,879	7.3%
	Subtotal Sport	108.4	1,018.0	831.3	66.3	0.0	2,023.9	23,496	11.5%
	Subtotal B.C.	704.8	3,536.0	3,523.9	403.6	0.0	8,168.2	89,801	44.0%
Wa/Or	Ocean Troll	0.0	36.1	524.1	24.1	0.0	584.3	5,004	2.5%
	N Pug S. Net	36.1	198.8	530.1	301.2	30.1	1,096.3	18,283	9.0%
	Oth Pug S. Net	90.4	469.9	602.4	24.1	0.0	1,186.7	8,886	4.4%
	Wa Coastal Net	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0%
	Net Subtotal	126.5	668.6	1,132.5	325.3	30.1	2,283.0	27,169	13.3%
	Ocean Sport	0.0	12.0	0.0	0.0	0.0	12.0	126	0.1%
	N Pug. S. Sport	0.0	500.0	945.7	578.3	108.4	2,132.4	45,039	22.1%
	Oth Pug. S. Sport	102.4	885.5	385.5	54.2	0.0	1,427.6	8,805	4.3%
	Subtotal Sport	102.4	1,397.5	1,331.3	632.5	108.4	3,572.1	53,970	26.4%
	Subtotal Wa/Or	228.9	2,102.3	2,987.8	981.9	138.5	6,439.4	86,142	42.2%
Elwha	Terminal Net	0.0	19.5	0.0	0.0	0.0	19.5	438	0.2%
	Terminal Sport	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0%
	Terminal Subtotal	0.0	19.5	0.0	0.0	0.0	19.5	438	0.2%
	Grand Total	933.7	6,632.2	7,120.1	1,758.9	144.6	16,589.5	204,182	100.0%
	Troll	0.0	2,427.6	3,614.3	704.8	6.0	6,752.6	89,409	43.8%
	Net	722.9	1,740.9	1,337.3	355.4	30.1	4,186.6	36,548	17.9%
	Sport	210.8	2,439.6	2,166.5	698.8	108.4	5,626.2	77,787	38.1%
	Terminal	0.0	19.5	0.0	0.0	0.0	19.5	438	0.2%

Table 14. Harvest distribution pattern for Elwha coho salmon under present river management conditions. Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG.

Present Condition
Assumes 3.5% Incidental Mortality Rate (of Landed Catch)
Harvest: 19,087 Incidental Mortality: 713
MSY Goal: 19,800 Available/(Over) Harvest (#s): 0
Overall Exploitation Rate: 90% (lbs): 0

Area	Fishery	Harvest in Numbers of Fish Adult Equivalent	Weight (lbs)	Percent by Weight
Alaska	SE Troll	136.6	1,002	0.8%
B.C.	N B.C. Troll	164.3	1,246	1.0%
	SC B.C. Troll	114.8	655	0.5%
	NW Van Troll	2,164.1	12,627	10.1%
	SW Van Troll	4,938.1	25,936	20.8%
	Troll Subtotal	7,381.4	40,464	32.5%
	SW Van Net	269.3	1,921	1.5%
	JNST St. Net	35.6	257	0.2%
	B.C. Juan Net	495.0	3,044	2.4%
	Net Subtotal	799.9	5,222	4.2%
	WC Van Sport	17.8	116	0.1%
	Geo St. Sport	1,461.2	9,492	7.6%
	Sport Subtotal	1,479.1	9,608	7.7%
	B.C. Subtotal	9,660.4	55,294	44.4%
Oregon	Troll	518.8	2,785	2.2%
	Sport	126.7	552	0.4%
	Oregon Subtotal	645.5	3,337	2.7%
Washington	Ilwaco Troll	25.7	82	0.1%
	Neah Bay Troll	778.1	4,283	3.4%
	Troll Subtotal	803.9	4,365	3.5%
	Grays Har Net	7.9	70	0.1%
	US Juan Net	898.9	7,660	6.1%
	Oth Puget Net	726.7	5,756	4.6%
	Subtotal Net	1,633.5	13,486	10.8%
	Grays Har Sport	4.0	26	0.0%
	La Push Sport	4.0	26	0.0%
	Neah Bay Sport	71.3	367	0.3%
	US Juan Sport	522.7	3,177	2.5%
	Sport Subtotal	601.9	3,595	2.9%
	Wa Subtotal	3,039.3	21,446	17.2%
	Elwha River Net	5,605.4	43,529	34.9%
	Grand Total	19,087.2	124,608	100.0%
	Troll	8,840.7	48,616	39.0%
	Net	2,433.4	18,708	15.0%
	Sport	2,207.7	13,755	11.0%
	Terminal Net	5,605.4	43,529	34.9%

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Table 15. Harvest distribution pattern for Elwha coho salmon with dams-in and harvest restrictions. Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG.

Dams In (Elwha Term Net Elimination, Present Exp. In Other Fisheries)
Assumes 3.6% Incidental Mortality Rate (of Landed Catch)
Harvest: 8,484 Incidental Mortality: 305
MSY Goal: 8,030 Available/(Over) Harvest (#s): (760)
Overall Exploitation Rate: 63% (lbs): (4,936)

Area	Fishery	Harvest in Numbers of Fish Adult Equivalent	Weight (lbs)	Percent by Weight
Alaska	SE Troll	86.0	631	1.2%
B.C.	N B.C. Troll	103.4	784	1.5%
	SC B.C. Troll	72.3	412	0.8%
	NW Van Troll	1,361.9	7,946	15.6%
	SW Van Troll	3,107.6	16,322	32.0%
	Troll Subtotal	4,645.3	25,465	49.9%
	SW Van Net	169.5	1,209	2.4%
	JNST St. Net	22.4	162	0.3%
	B.C. Juan Net	311.5	1,916	3.8%
	Net Subtotal	503.4	3,286	6.4%
	WC Van Sport	11.2	73	0.1%
	Geo St. Sport	919.6	5,974	11.7%
	Sport Subtotal	930.8	6,047	11.9%
	B.C. Subtotal	6,079.5	34,798	68.2%
Oregon	Troll	326.5	1,753	3.4%
	Sport	79.7	347	0.7%
	Oregon Subtotal	406.2	2,100	4.1%
Washington	Ilwaco Troll	16.2	52	0.1%
	Neah Bay Troll	489.7	2,695	5.3%
	Troll Subtotal	505.9	2,747	5.4%
	Grays Har Net	5.0	44	0.1%
	US Juan Net	565.7	4,821	9.4%
	Oth Puget Net	457.3	3,623	7.1%
	Subtotal Net	1,028.0	8,487	16.6%
	Grays Har Sport	2.5	16	0.0%
	La Push Sport	2.5	16	0.0%
	Neah Bay Sport	44.9	231	0.5%
	US Juan Sport	329.0	1,999	3.9%
	Sport Subtotal	378.8	2,262	4.4%
	Wa Subtotal	1,912.7	13,496	26.5%
	Elwha River Net	0.0	0	0.0%
	Grand Total	8,484.4	51,024.9	100.0%
	Troll	5,563.6	30,595	60.0%
	Net	1,531.4	11,773	23.1%
	Sport	1,389.3	8,656	17.0%
	Terminal Net	0.0	0	0.0%

Table 16. Harvest distribution pattern for Elwha coho salmon with dams-removed and harvest restrictions. Source: Coded wire tag data returns from ADF&G, CDFO, WDF, & ODFG.

Dams Out (Elwha Term Net Elimination, Present Exp. In Other Fisheries)
Assumes 3.6% Incidental Mortality Rate (of Landed Catch)
Harvest: 10,005 Incidental Mortality: 382
MSY Goal: 10,614 Available/(Over) Harvest (#s): 227
Overall Exploitation Rate: 65% (lbs): 1,759

Area	Fishery	Harvest in Numbers of Fish Adult Equivalent	Weight (lbs)	Percent by Weight
Alaska	SE Troll	101.4	744	1.2%
B.C.	N B.C. Troll	122.0	925	1.5%
	SC B.C. Troll	85.2	486	0.8%
	NW Van Troll	1,606.1	9,371	15.6%
	SW Van Troll	3,664.8	19,248	32.0%
	Troll Subtotal	5,478.0	30,030	49.9%
	SW Van Net	199.8	1,426	2.4%
	JNST St. Net	26.4	191	0.3%
	B.C. Juan Net	367.4	2,259	3.8%
	Net Subtotal	593.6	3,875	6.4%
	WC Van Sport	13.2	86	0.1%
	Geo St. Sport	1,084.4	7,045	11.7%
	Sport Subtotal	1,097.7	7,130	11.9%
	B.C. Subtotal	7,169.3	41,036	68.2%
Oregon	Troll	385.0	2,067	3.4%
	Sport	94.0	410	0.7%
	Oregon Subtotal	479.0	2,477	4.1%
Washington	Ilwaco Troll	19.1	61	0.1%
	Neah Bay Troll	577.5	3,178	5.3%
	Troll Subtotal	596.6	3,239	5.4%
	Grays Har Net	5.9	52	0.1%
	US Juan Net	667.1	5,685	9.4%
	Oth Puget Net	539.3	4,272	7.1%
	Subtotal Net	1,212.3	10,009	16.6%
	Grays Har Sport	2.9	19	0.0%
	La Push Sport	2.9	19	0.0%
	Neah Bay Sport	52.9	273	0.5%
	US Juan Sport	387.9	2,357	3.9%
	Sport Subtotal	446.7	2,668	4.4%
	Wa Subtotal	2,255.6	15,916	26.5%
	Elwha River Net	0.0	0	0.0%
	Grand Total	10,005.3	60,172.2	100.0%
	Troll	6,561.0	36,080	60.0%
	Net	1,805.9	13,884	23.1%
	Sport	1,638.4	10,208	17.0%
	Terminal Net	0.0	0	0.0%

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Table 17. Summary of present versus future production and harvest under three scenarios for Elwha River management.

	PRESENT	FUTURE WILD STOCK RESTORATION DAMS IN PLACE	FUTURE WILD STOCK RESTORATION DAMS REMOVED
COHO			
MSY (no.)	19,800	8,030	10,614
Escapement (no.)	2,200	5,815	5,713
U.S. Catch (% of weight)	56%	24%	34%
Weight U.S. Catch (lbs)	69,314	11,291 1	20,896 2
% Total Catch (no.)	49%	19%	30%
Catch U.S. (no.)	4,353	2,405 1	2,837 2
CHINOOK			
MSY (no.)	10,000 3	9,587	21,013
Escapement (no.)	3,500	4,511	5,952
U.S. Catch (% of weight)	56.0%	60.3%	68%
Weight U.S. Catch (lbs)	66,278	71,767 4	195,109 5
% Total Catch (no.)	51%	53%	59%
Catch U.S. (no.)	4,877	4,879 4	12,007 5

1 Requires closure of in-river fishery and some commercial net, troll, and sport fisheries
2 Requires closure of in-river fishery
3 Actual value should be 10,800 since DEIS makes mathematical errors
4 Assumes excess production taken by U.S. terminal fishery
5 Assumes excess production taken by U.S. terminal fishery

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ECONOMIC EVALUATION OF ALTERNATIVES

Table 2-12 of the DEIS provides an economic analysis of the net present value of costs occurring over a 50-year period (1996-2046) for four different alternatives designed to rebuild wild fish runs on the Elwha. Unfortunately, similar analyses of the benefits (or losses) that may result from the fish runs associated with each alternative are not available and hence the true costs and benefits of each river management alternative cannot be determined.

NRC has thus evaluated the present net value of chinook, coho, and steelhead under the (1) current situation (no modifications of the dams and continued hatchery operations), (2) dam retention alternative, and (3) removal of both dams scenario. Annual values of fish harvests under each of the river management scenarios are described in Table 18. The present value of these harvests over the 50 year period of analysis are presented in Table 19. Economic estimates incorporate the valuation of harvests for each of the river management scenarios in all affected fisheries in Washington, Oregon, Alaska, and British Columbia. Benefits accruing to local Washington fisheries are a subset of this total and can be estimated from harvest numbers presented in Tables 11 - 16. The economic methodology used to calculate the values in Tables 18 - 20 is provided in Appendix VI. JR-255

Table 18. Annual value of Elwha salmon harvests in U.S. and Canadian commercial, tribal, and recreational fisheries under three river management scenarios after restoration has been achieved and harvest renewed.

SPECIES	Present	Dollar Value Dams-in	Dams-out
Chinook (comm'l & tribal)	$110,244	$118,221	$315,716
Sport chinook	$146,745	$176,675	$251,820
Coho (comm'l & tribal)	$162,262	$61,366	$72,236
Sport coho	$88,320	$55,641	$65,001
Steelhead: Tribal	$13,482	$5,408	$10,591
Steelhead: Sport	$225,000	$90,250	$178,500
TOTAL	$746,063	$507,561	$893,864

JR-255: Staff does not disagree with the method used by NRC to calculate annual and present values of Elwha salmon harvests under present and future conditions, except insofar as the chances for recovery of pink and chum salmon are concerned. Staff's equivalent analysis has been added to the socioeconomic section of each alternative to clarify what the net economic change in the commercial catch would be. We agree that the economic effects would be adverse over the recovery period, and that some alternatives offer only limited benefits thereafter.

Regardless of differences in staff's viewpoint on some of the details of this analysis, it does make a very useful contribution to the discussion by putting into perspective the expected changes in the commercial value of the fish versus the cost of achieving fish recovery.

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Table 19. Present value over 50 year study period of Elwha salmon harvests in U.S. and Canadian commercial, tribal, and recreational fisheries under three river management scenarios.

SPECIES	Dollar Value Present	Dams-in	Dams-out
Chinook(comm'l & tribal)	$2,836,552	$3,041,798	$4,980,615
Sport chinook	$3,775,714	$4,545,806	$3,972,652
Coho(comm'l & tribal)	$4,146,094	$1,560,742	$1,126,436
Sport coho	$2,272,453	$1,431,630	$1,035,440
Steelhead: Tribal	$346,889	$139,147	$167,081
Steelhead: Sport	$5,789,197	$2,322,111	$2,815,973
TOTAL	$19,166,899	$13,041,234	$14,098,197

JR-255 cont'd

It is interesting to note that the total net present value for chinook, coho, and steelhead is considerably higher under the current situation than for either of the other two alternatives. In the dam-retention alternative, this occurs because of the expected loss in the coho and steelhead catch and only marginal increases in chinook harvest, plus the necessity to sharply curtail U.S. coho catches to meet management needs. For the dam-removal analysis, the net present value shows only a marginal increase over the dam retention scenario despite a doubling of the chinook harvest because of the multi-year lag between dam removal and MSY-level harvests for each of the species under consideration in this scenario.

The overall economic effect of the proposed dam removal option can be shown by summing the positive and negative present values for the several species and fisheries and combining the result with the present value of the stream of costs incurred over the construction/de-construction period. Even though the time profiles of costs and benefits are different, this permits comparison on a consistent basis. It should be emphasized again that evaluation of the dam removal alternative in terms of present values references all good and bad outcomes to today's viewers, based on purely economic measures. It does not consider society's possible preferences for pristine settings. What it can do is make clear the cost of such decisions.

Our data, combined with estimates by others of project costs, make it clear that removal of the dams is not economically viable in the narrow sense defined above. Given the high degree of uncertainty about the ability to preserve and restore to full theoretical productivity some of the key fish stocks in the Elwha, it is not clear that dam removal makes a positive contribution in the even narrower sense of fishery conservation.

An economic summary of the net present value of the dam-retention and dam-removal scenarios that partially offsets the cost of construction or de-construction by the value of harvested fish is provided in Table 20. For the

purposes of discussion we have accepted costs presented in the DEIS for dam removal. Net costs (total cost of construction or de-construction less the value of associated fish harvests) equal $26 million and $230 million for the dam retention and dam removal options, respectively. These values, however, fail to consider lower fish production resulting from reduced coho production and down-time, zero (or near-zero) harvest losses for the dam removal proposal. If these are taken into account (Table 21), overall costs actually increase above those provided in the DEIS Table 2-12 and in our Table 20. These values, of course, do not include gains that might be achieved from chum and pink catches because, as discussed earlier, we consider the restoration potential for chum and pink salmon to be poor. If the actual costs of dam removal are higher than those presented in the DEIS then overall net costs minus the value of associated fish harvests would be higher than those presented here.

The distribution of the benefits from increased chinook production (dams out) largely flows to the Alaskan troll, the British Columbia troll fishery, and the U.S. in-river fisheries. For coho, the major loser is the in-river tribal fishery under both the applicant's and the dam-removal scenarios.

JR-255 cont'd

Table 20. Net cost of two river management scenarios, assuming a 50-year period of analysis and incorporating current versus post-construction or de-construction fish harvest values.

DEIS Scenario	Total Cost of De-construction	Value of Salmon Harvest	Net Economic Costs
Dams-in	$39,113,000	$13,041,234	$26,071,766
Dams-out	$245,076,000	$14,098,197	$230,977,803

Alternative	Benefit or Cost
Net present value of harvests under current river management	$ 19,166,899
Costs of dam-retention scenario	39,133,000
Loss in fish value from current situation	6,125,665
Total dam-retention costs	$45,258,665
Cost of dam-removal scenario	$245,076,000
Loss in fish value over current situation	5,068,702
Total dam-removal costs	$250,144,702

DISCUSSION AND CONCLUSIONS

The current Elwha River DEIS dealing with various plans for restoring wild salmon runs to the river contains a number of mathematical errors, incorrectly calculates in-river juvenile and adult dam and lake passage mortalities, and, in our view, misapplies population dynamics theory to forecast future salmon run sizes and potential harvest. The results of the mathematical and methodological errors and calculations lead to an exaggerated perception of the magnitude and benefits of salmon runs under the dams-removed scenarios and overestimates the passage mortalities for the dams-in scenario. NRC estimates of chinook, coho, and steelhead adult production, dams removed, were 26,965, 16,327, and 6,577, respectively. For dams in, the values were 14,098, 13,845, and 4,513. The NRC production estimates, as well as those noted in the DEIS, are based on theoretical Ricker spawning stock recruitment curves which (often) empirical data do not support and hence production estimates should be viewed with caution. Further, maintaining harvest at optimum levels presumes that an operative management system is in place to control levels of removals or to account for them throughout the life cycle and range of the stock distribution. Often this is not the case.

JR-256 The most troublesome aspects of the DEIS are its failure (1) to provide any economic appraisal of the cost of dam removals versus gains or losses resulting from expected changes in fish run sizes, (2) to identify methods and strategies to protect current genetic stock units during dam removal, and (3) to deal in any substantive manner with the interim and longer-term management requirements needed to ensure stock maintenance during the de-construction period and to ensure the long-term productivity of the salmon runs after they have been rebuilt. Although it is clear that the benefits perceived by the National Park Service and other interests are largely associated with "restoration of the river system to its natural state," there is no attempt to provide the reader information on potential public costs, impacts on specific user groups, and/or economic benefits or losses to be expected.

From our viewpoint, the reader is provided a rosy picture of future benefits of the dams-removed scenario, with no attempt to point out the real economic costs versus benefits and associated environmental, biological and economic risks, including potential management implications.

It should be clear from a strict economic accounting of costs versus benefits which might be derived from fishing under the dams-removed and dams-in fish passage proposals, that both alternatives loom as economic nightmares. In both cases, the net present economic value of the harvested fish would decline substantially as compared to existing conditions. The net costs, assuming a 50-year period, for the dam removal option would exceed $250,000,000, while the dams-in with fish passage devices installed

JR-256: See response JR-255. Staff agrees with the statement that "dam removal acceptance must rest almost exclusively on the value the public places on returning the river to near-pristine conditions or rebuilding wild stocks in the river." Indeed, it was that conviction that led to the deemphasis in the EIS on commercial market values.

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would cost around $45,000,000 over the same time period. Thus, dam removal acceptance must rest almost exclusively on the value the public places on returning the river to near-pristine conditions or rebuilding "wild" stocks in the river. From the standpoint of fish production alone, the money would be better spent elsewhere.

Also, in our view, the removal of the dams is not without substantial risk to the maintenance of existing stock units unless some alternative plans are put in place to ensure environmental degradation of the river, and/or fishing activities in the post-dam period do not result in a major decline in extant coho, steelhead, or chinook stocks. If no such plans are developed, it is possible that the current runs could be threatened and/or become endangered. These possibilities, plus the uncertainties of downstream management options, lead us to the conclusions that serious consideration and definitive plans with operator's cost estimates should be pursued under both options (dams in/dams out) to continue operation of the Elwha hatchery system as an interim facility to guarantee stock viability and to assist in up-river stock restoration. If this option is deemed unacceptable, then some alternative plan to protect extant stocks needs consideration.

JR-256 cont'd

Finally, from the perspective of the State of Washington, it should be clear that future coho production is unlikely to contribute much under both scenarios unless there are substantial gains resulting from U.S./Canada tradeoffs. Even for chinook, the majority of the Elwha catch will be taken in Alaska and Canada. If there are serious short-term management problems resulting from environmental degradation on extant chinook runs, the uncertainty of the U.S./Canada management possibilities needs to be taken under consideration.

Whatever decision is made regarding the future of the Elwha, it should be taken in an enlightened understanding of what we can reasonably expect in terms of future runs, the time required to restore such runs to MSY, and the associated risks and costs. These factors are not adequately addressed and/or available in the current DEIS. The DEIS should be revised to correct current inconsistencies and mathematical errors and should be expanded to address issues of resource management required to ensure stock maintenance for the dams-in and dams-removed options. A full discussion of mechanisms of how and if the hatcheries will be used during periods of shifting to wild stock production should be provided. Finally the DEIS should reveal to the public a clear understanding of the costs and benefits, as well as the risks, of the proposed options.

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APPENDIX I

BIOGRAPHIES OF NRC PROFESSIONAL STAFF AND SUBCONTRACTOR

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BIOGRAPHIES OF NRC PROFESSIONAL STAFF AND SUBCONTRACTOR

Dr. Dayton L. Alverson, President, was special assistant to the Assistant Administrator for Fisheries, National Oceanic and Atmospheric Administration, at the time he left U.S. government service in January 1980. His post required bringing experience and judgment to bear on the complex scientific, economic, political, and international elements involved in setting policy for the public-domain fishery resources off Alaska, Washington, Oregon, and California. As director of the Northwest and Alaska Fisheries Center (NWAFC) from 1970, Dr. Alverson was responsible for planning, managing, administrating, and evaluating the comprehensive research and development studies conducted by the NWAFC in the fields of fishery biology, zoology, oceanography, chemistry, physical sciences, engineering, and fishery methods and equipment. Dr. Alverson is past chief negotiator for the United States in the U.S./Canada salmon interception negotiations.

In addition to his career in the fisheries of the United States, Dr. Alverson has long been active in international fisheries matters. He was for a number of years member and/or chairman of the Advisory Committee on Marine Resources Research (ACMRR) of the Food and Agriculture Organization of the United Nations. In that capacity, Dr. Alverson was involved in many scientific and technical initiatives for aiding the fisheries of developing countries on a worldwide basis. He is the author of over 100 publications on fisheries resources and their utilization.

Dr. James A. Crutchfield is a world-recognized fishery economist with extensive experience in developing countries. His publications in fishery economics are used throughout the world in training and education in fishery science and management. His special areas of competence include industrial organization and price policy, resource economics, and policy development and administration of natural resources. Throughout his career he has served as consultant, advisor, chief of mission, technical expert, committee member, and chairman for many organizations in the United States and abroad. His extensive and continually growing list of varied publications covers most economic aspects of the use of the earth's natural resources.

Mr. Douglas McNair, who joined the firm in 1985, is skilled in media-related and market research aspect of fisheries. He has been editor of Pacific Fishing Magazine and Seafood Trend newsletter, and has been involved in preparation of other material of a semi-technical nature dealing with resource management, political aspects of fisheries legislation, harvesting, marketing, product development, etc. Since joining NRC, Mr.

McNair has done extensive market research work in the area of surimi products. He also played a key role in the research, preparation, and publication of NRC's "Commercial Fishing and the State of Washington," a document intended for broad circulation which as recently received a good deal of public acclaim. Through Mr. McNair's skills, NRC is now able to offer a more complete range of services in publications, communications, and market research.

Mr. Jeffrey June joined NRC as an associate in 1985 and became an officer in 1988. Mr. June studied at Humboldt State University and the College of Fisheries at the University of Washington where he was an Egtvedt Scholarship recipient, specializing in population dynamics and resource assessment. Prior to joining NRC, Mr. June was a member of the Bering Sea resource assessment team with the National Marine Fisheries Service, where for six years he acted as chief scientist on numerous cruises in the North Pacific and was active in International North Pacific Fishery Commission affairs and bi-lateral fishery agreements between the United States and foreign nations. While with the National Marine Fisheries Service, Mr. June received several outstanding achievement awards. Mr. June has experience in inland fisheries as well, having worked for Weyerhaeuser Company as a stream ecologist conducting research into fresh water stream habitat analysis. Mr. June also has extensive experience in development of commercial fisheries in foreign countries, with former assignments in Peru, Micronesia, and most recently as senior scientist on a two-year large-scale fisheries development project in the offshore waters of Somalia, funded by the World Bank and conducted by NRC. He has authored or co-authored numerous publications on subjects ranging from taxonomy to fishery management. Mr. June brings to NRC a varied background from the fresh water and marine environments, including commercial fishery development, quantitative assessment skills, and an ecological approach to fishery issues.

Mr. Mark Freeberg, who joined NRC in 1988, has degrees in Environmental Science from Bradley University, Fisheries Management from Michigan State University, and Marine Policy from the Institute for Marine Studies at the University of Washington. Mr. Freeberg has worked as a U.S. Congressional Intern in congressional offices and with the National Marine Fisheries Services (NMFS). After completing his congressional internship, Mr. Freeberg worked for NMFS where his tasks included the coordination of an extensive process of information synthesis, software development, and hardware testing for a microcomputer-based fisheries information network. Mr. Freeberg also initiated the development of an on-line compendium of international, federal, and state fisheries and seafood industry contacts, regulations, and legislation. Mr. Freeberg returned to graduate school in 1987 where, in addition to his studies and research, he supervised the use and maintenance of a network of microcomputers and printers. His tasks also included formal and informal microcomputer training for students, staff, and academicians.

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While at NRC, a large share of Mr. Freeberg's work has involved his role as staff support within the 1988 marine mammal negotiations. His responsibility therein required extensive and intensive interaction with fishing industry, environmental community, congressional staff, and federal management agency representatives. Mr. Freeberg used this experience as the basis of his marine policy thesis in which he explored the marine mammal negotiations and their dynamics in great detail. Mr. Freeberg brings to NRC a unique combination of microcomputer, fisheries management, and marine policy development skills.

Dr. Gary Morishima, subcontractor to NRC, received a Ph.D. in Quantitative Science and Environmental Management from the University of Washington. His academic training concentrated in the areas of mathematics, fisheries management, operations research, and resource economics. Dr. Morishima has twenty-seven years of professional experience in modeling and fisheries management, including employment as a Ford Fellow at the Center for Quantitative Science at the University of Washington, a systems analyst for the Boeing Company, and technical advisor in natural resource management to the Quinault Nation. He has served on the Executive Board of the Intertribal Timber Council since its inception in 1978. He has acted as a consultant and expert witness for both forestry and salmon fisheries management in legislative and judicial processes. He served as a member of the Salmon and Steelhead Advisory Commission from 1982 to 1985 by appointment of the U.S. Secretary of Commerce under the authority of the Salmon and Steelhead Conservation and Enhancement Act of 1980. Currently Gary is a member of the Salmon Technical Team of the Pacific Fishery Management Council and of the Joint Technical Committees on Research and Statistics, Chinook, Coho (U.S. Section Chair), and Data Sharing established under the Pacific Salmon Treaty between the United States and Canada.

APPENDIX II

REVIEW OF SWEASEY DAM REMOVAL

ON THE MAD RIVER, CALIFORNIA

EXHIBIT

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REVIEW OF SWEASEY DAM REMOVAL

Removal of dams on the Elwha River would represent the first destruction and clearing of a dam on the West Coast with the object of ecosystem restoration. Although not removed solely for fish restoration purposes, the removal of Sweasey Dam on the Mad River in northern California offers a comparison of the effects of dam removal on an anadromous salmon and steelhead river. The Mad River offered the only West Coast case study relevant to the Elwha River Proposal. Mr. Jeffrey June of NRC had previously worked on the Mad River and was familiar with the dam removal project. Natural Resources Consultants, Inc., has conducted interviews with current and retired California Department of Fish and Game (CDF&G) and Humboldt State University personnel to collect information on Sweasey Dam removal on the Mad River in Humboldt County, California.[1]

Background

The Mad and Elwha Rivers are similar in fish resources, in that each supports populations of chinook and coho salmon and steelhead trout. Both rivers are also similar in discharge rates. The following information summarizes characteristics of each system:

Characteristic		Elwha River	Mad River
Drainage Area		321 sq mi	700 sq mi
Basin Width		10 miles	5-11 miles
Basin Length		35 miles	75 miles
Gradient	Upper	6-16%	5-6%
	Middle	1%	1-3%
	Lower	0.33%	0.5-1.0%
Discharge			
Low		600-1,000 cfs (Jul-Sept)	75-500 cfs (Jul-Sept)
High		2,000-3,000 cfs (Nov-Mar)	1,000-3,000 cfs (Dec-Mar)
Peak		27,700 cfs (Nov & Mar)	10,000 cfs (Jan-Feb)
Low		200 cfs (Sept)	25 cfs (Sept)
Water Quality		High	High
Sediment Load		Moderate	Moderate
Fishery Resources (Approximate number of return spawners)			
Steelhead		1,000	1,000
Chinook		19,000	1,000
Coho		17,000	650

[1]Telephone interviews were conducted between mid-May and early June 1991 with Mr. Larry Preston--CDF&G, Mr. Phil Warner--CDF&G, Mr. Don LaFonce-CDF&G retired, Mad River fish hatchery personnel, and Dr. Terry Roelofs-Humboldt State University researcher.

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Sweasey Dam was constructed in 1950, primarily for municipal water storage. It is located approximately 11 river miles upstream from the mouth of the Mad River. Sweasey dam was 55 ft above the stream bottom and impounded approximately 1,300 acre feet of water. The dam was equipped with a step/pool-type fish ladder which allowed passage of salmon and steelhead above the dam site. Downstream migrating fish were passed over a spillway during high flows and through a bypass during lower flows.

Dam Removal

By 1969, the storage area behind the dam had become almost entirely filled with 2.4 million cubic yards of sediment and woody debris. Fine sediments had also impacted the river two to three miles above the reservoir. The Army Corps of Engineers, California Department of Fish and Game, and the City of Eureka Department of Public Works evaluated the safety and maintenance requirements of the facility and a decision was made to remove the dam and associated structures.

Although there were no formal removal or fish restoration plans developed or implemented, the opinion of most of the participants was that (1)there would be an acceptable sediment load for several years which might adversely effect fish spawning, (2) the river would form a channel through the fine sediment and debris behind the dam, carrying most sediment down the river on high flows while the remaining sediment banks would re-vegetate naturally and stabilize, and (3) the stream channel downstream from the dam would have minor changes resulting in an increase of one foot in the flood stage.

Preliminary minimal site investigations were conducted in late 1969. No attempt was made to assess the configuration of the sediment behind the dam to determine post-dam removal sediment loads or stability of remaining sediment banks. The dam removal was approved in late 1969. Sweasey Dam was removed with explosives in August 1970 during a low-flow period. A steelhead trout hatchery was built about four miles below the dam site in 1970 and began operation in 1971. The hatchery was not built for mitigation purposes and has produced mainly steelhead trout.

Recovery and Short- and Long-Term Effects

The Mad River below the dam remained heavily loaded with sediments for several weeks immediately after the dam removal. The first substantial rains and resulting runoff occurred in late September 1970 and resulted in additional movement of fine sediment from the dam site downstream. During the first winter after dam removal (December 1970 - February 1971), nearly all of the sediment from the dam site was transferred downstream. Little, if any, sediment remained in the area behind the dam location. During each storm the Mad River had higher than normal turbidity, based on visual observation by CDF&G personnel. By the next summer (1971), it

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was evident that the river channel three to five miles below the dam site had been altered. Previous to the dam removal, the river channel had been a series of riffles and pools which provided upstream adult salmon and steelhead migration routes. After dam removal the river channel became wider and shallower. Most, if not all, of the deeper holes had filled in with coarse and fine sediment.

Anecdotal information from CDF&G personnel indicated that the Mad River contained a stock of exceptionally large chinook salmon, with individuals of over 30 lbs not uncommon. During the summer/fall low-flow periods in 1971 and 1972 when adult chinook salmon were migrating upstream, the shallow areas which had developed below the dam site essentially restricted further upstream migration. CDF&G personnel reported seeing many salmon "beached" in the shallows and killed by elevated water temperatures and stranding. At least 150 chinook salmon died in the summer/fall of 1971.

Although alterations in the river channel were expected to be only a temporary phenomenon, the channel remained shallower and wider up to seven miles below the dam site for five to ten years after removal of the dam and presently remains shallower than from the pre-dam removal period in some locations. Although pools have re-formed in most areas below the dam site, the Mad River continues to have problems with upstream chinook migration and mortality due to elevated water temperatures. A second dam, Ruth Dam, which is still in place, was constructed in 1962 approximately 30 miles upstream from Sweasey Dam. Ruth Dam continues to be required to release storage water during low-flow periods to attempt to maintain flows adequate for upstream migration, particularly during drought periods.

Researchers at Humboldt State University have monitored sediment size composition at several commercial gravel mining sites on the Mad River downstream from the Sweasey dam site. Their data suggest that the fine sediment "wave" from the dam site may just now be exiting the lower river, 20 years after the dam removal. However, this is difficult to prove conclusively, since much of the lower Mad River valley is a farming area which contributes to river sediment levels, and logging in the upper watershed may also be contributing some sediment load. The stream channel below the dam site remains somewhat unstable, resulting in bank erosion and frequent channel changes during high flows. This bank erosion also contributes to the river's sediment load.

Since the Sweasey Dam was removed, the mouth of the Mad River has moved steadily northward from its historical outflow location into the Pacific Ocean. It is presently over three miles farther north than its pre-dam removal location. Whether this is the result of increased sediment load caused by removal of Sweasey Dam is not known, but the effect of sedimentation at the mouth may further impede upstream fish migration.

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CDF&G biologists believe the removal of Sweasey Dam will, if it has not already, ultimately result in improved conditions for salmon and steelhead production in the Mad River. Returns of salmon and steelhead to the Mad River[2] have been quite variable since the dam removal:

	Chinook salmon			Coho salmon			
Year	Males	Females	Immature	Males	Females	Immature	Steelhead
1971-72	60	178	85	90	178	69	42
1972-73	241	415	380	105	130	231	52
1973-74	337	53	105	105	176	46	1,086
1974-75	110	71	50	67	74	19	311
1975-76	53	41	184	167	339	1,597	190
1976-77	323	155	661	88	129	976	558
1977-78	95	68	87	163	289	194	1,191
1978-79	37	19	190	42	31	524	2,190
1979-80	51	77	17	39	90	223	1,411
1980-81	26	40	20	56	106	341	730
1981-82	32	6	213	16	62	135	442
1982-83	257	391	900	73	76	473	1,087
1983-84	119	194	124	11	11	65	774
1984-85	21	13	48	12	8	4	991
1985-86	149	28	98	24	14	7	753
1986-87	106	121	72	29	39	265	13,807
1987-88	253	315	278	94	126	733	4,303
1988-89	49	110	83	93	161	591	2,529
1989-90	10	19	17	18	17	221	1,027
1990-91	0	0	1	17	27	48	915

Unfortunately, estimates of returning escapement run sizes are not available for the period prior to the dam removal. Most other coastal river systems in California have had declines in anadromous fish populations but year-to-year fluctuations in return run strength have generally not been as great as the Mad River system. CDF&G conducted periodic fish counts at the Sweasey Dam fish ladder and spawner ground counts above the dam site. Chinook, coho, and steelhead utilized the upper Mad River by way of the fish ladder on Sweasey Dam prior to the dam removal. There is no indication that upstream utilization of the Mad River by chinook and coho has increased since the dam was removed. Some evidence exists that Sweasey Dam did impede fish migration, since the fish ladder was observed clogged with debris on many occasions. During these instances, Canyon Creek, located just below Sweasey Dam, often had large concentrations of fish. Although factors other than those influenced by dam removal may have impacted the returning run sizes, there has, nevertheless, been no substantial increase in the production of salmon or steelhead in the 21 years since Sweasey Dam was removed. In 1990-1991 only one chinook salmon was captured at the hatchery weir.

[2]Capture statistics are measured at the Mad River hatchery weir.

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Summary

Several important considerations concerning the Elwha River proposals are evident from reviewing the Sweasey Dam removal on the Mad River.

1. The ability to stabilize sediments in the drainage area behind the dam removal sites is questionable.

   Although there was no formal stabilization plan for sediments behind Sweasey Dam, the basic instability of the stream channel flowing through essentially unstable river banks within the uncovered reservoir tended to cause erosion of sediment banks and movement of fine sediments to downstream spawning areas. On the Elwha River, this may be of particular concern in Lake Mills where sediment banks and the river channel will be at relatively high gradient. The total amount of sediment behind the Elwha River dams is estimated to be at least 15.93 million cubic yards[3] in contrast to the 2.4 million cubic yards behind Sweasey Dam. Loss of the entire sediment loads behind Elwha, Glines Canyon, or both dams could be catastrophic, certainly for several years and perhaps much longer, to fish spawning grounds below the dams where the Elwha River gradient is relative low.. The DEIS should offer a more detailed analysis of the precise method of sediment stabilization to be used in the Elwha River after removal of the dams, since this may be one of the most critical issues in wild stock restoration.

2. Changes in the stream channel downstream from the dam sites due to sediment movement may disrupt fish passage.

   The Mad River channel downstream from Sweasey Dam was altered by the removal of the dam and the resulting displacement of stored sediments. The resulting channel was wider, shallower, and less stable. During the first several years after dam removal, chinook salmon passage upstream was blocked during critical low-flow periods by the shallow stream channel resulting in significant fish mortality. The river channel remains altered after 20 years, with reduced upstream adult fish habitat and continued fish passage and water temperature problems. The Elwha River has experienced chinook adult mortalities (up to 30%) from disease/elevated water temperatures. These problems, combined with upstream passage problems due to potential stream channel changes, are not adequately addressed in the DEIS.

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[3] Draft Environmental Impact Statement - FERC/EIS-0059D, Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington, Federal Energy Regulatory Commission, Office of Hydropower Licensing, February 1991, pages 3-12, 3-14.

3. Increased sediment movements may alter the outflow and possibly the location of the mouth of the river.

   The mouth of the Mad River has continually migrated north of its historical location since dam removal. It is not known whether the movement of sediment caused by dam removal is responsible for the movement of the river mouth. The DEIS should address this possibility and its effects on the Elwha River and surrounding Strait of Juan de Fuca.

4. Fish production has not increased significantly above the dam removal site.

   Although many factors, including harvest rates, drought, and other environmental factors, affect the production of fish in any river system, the production of coho and chinook salmon have not significantly increased in the Mad River since removal of Sweasey Dam. Coho, chinook, and steelhead utilized the upper Mad River by way of the fish ladder at Sweasey Dam prior to dam removal. Sweasey Dam was observed to be an impediment to upstream fish passage under some conditions. However, 21 years after removal of the dam, there has been no significant increase in production of coho and chinook salmon in the Mad River. Returning run sizes have fluctuated widely from year to year. Presumably, no marked increase in production has occurred for coho or chinook above the dam site. Coho and chinook are not reared in the Mad River hatchery and wild stock production is dependent upon natural migration to spawning areas. The history of the Mad River may indicate that the use of areas above dam removal sites by wild fish is a slow process requiring long-term changes in spawning migration patterns. The DEIS should more clearly address the time required for full utilization of the upper Elwha River by wild stocks.

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APPENDIX III

NOTES ON STOCK-RECRUITMENT FUNCTIONS AND EFFECTS OF DAM PASSAGE MORTALITY

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NOTES ON RICKER STOCK-RECRUITMENT FUNCTIONS AND EFFECTS OF DAM PASSAGE MORTALITY

ESTIMATION OF OPTIMUM (MSY) ESCAPEMENT LEVEL

A Ricker stock-recruitment production of the form depicted in equation (1) is convenient when equilibrium escapement is known:

(1)

$$R = S \cdot e^{a \cdot (1 - \frac{S}{b})}$$

where:
R = Recruitment (in adult equivalents)
S = Spawners
a = Ricker parameter "intrinsic rate of increase"
b = Ricker parameter "equilibrium escapement" i.e. recruitment = escapement in absence of fishing

A production relationship for an unfished population can be expected to hold, on average, so long as the reproductive characteristics of the spawning population remain unchanged. When a population is exploited, however, the reproductive potential per spawning adult can be changed. For example, intensive exploitation of chinook salmon by hook and line fisheries with minimum size limits for several years prior to maturity results in selective harvest pressures on older and larger fish. Since males mature earlier than females and since the number of eggs carried per female increases with age and size, the reproductive potential per spawner will be altered. This suggests that the underlying basis for a stock-recruitment relationship is unlikely to hold when fishing regulations that affect the reproductive potential per spawner are unstable.

GENERAL CASE - POPULATION NOT SUBJECT TO DAM PASSAGE MORTALITY

Estimation of MSY spawning escapement when Ricker "a" and estimate of equilibrium spawning escapement (Ricker "b") known:

The MSY spawning escapement is found by solving the following transcendental equation:

(2)

$$\left(1 - a \cdot \frac{MSY}{b}\right) \cdot e^{a \cdot (1 - \frac{MSY}{b})} = 1$$

Finding the solution to equation (2) can be somewhat tedious. However, Hilborn developed the following approximation to determine the MSY spawning escapement: [1]

(3)

$$MSY = (.5 - .07 \cdot a) \cdot b$$

Estimation of MSY spawning escapement when Ricker "a" and estimate of spawning escapement at maximum recruitment known:

Spawners S_m required for maximum recruitment can be calculated as:

(4)

$$S_m = \frac{b}{a}$$

Therefore, the equilibrium spawning escapement is simply:

(5)

$$b = a \cdot S_m$$

By replacement in equation (3), the MSY spawning escapement can be approximated by:

(6)

$$MSY = (.05 - .07 \cdot a) \cdot (a \cdot S_m)$$

1 Hilborn, Ray (1985). Simplified Calculation of Optimum Spawning Stock Size From Ricker's Stock Recruitment Curve. Canadian Journal of Fisheries and Aquatic Sciences (42):1833-1834.

DAM PASSAGE MORTALITY

Consideration of dam passage mortality of juveniles:

When additional juvenile mortalities caused by dam passage are considered, the production function becomes:

(7)

$$R = DS_j \cdot S \cdot e^{a(1 - \frac{S}{b})}$$

where:
DS_j = Downstream dam passage survival of juveniles

Dam passage mortality has three major effects: (1) the point of MSY spawning escapement is lowered; (2) the effective carrying capacity is reduced; and (3) the sustainable exploitation rate at MSY spawning escapement is reduced. (figure 1)

The MSY spawning escapement can no longer be estimated through the approximation given in equation (3). Instead, MSY spawning escapement is found by maximizing the following quantity:

(8)

$$MSY \cdot (DS_j \cdot e^{a \cdot (1 - \frac{MSY}{b})} - 1)$$

Consideration of dam passage mortality of adults

When only pre-spawning mortality of adults caused by dam passage problems is considered, MSY spawning escapement is found by maximizing:

(9)

$$MSY \cdot (e^{a \cdot (1 - \frac{MSY}{b})} - \frac{1}{DS_a})$$

where: DS_a = Dam Passage Survival of Adults

The sustainable yield is higher than that attainable when downstream mortality of juveniles is considered because the production is larger (figure 2).

Effect of both downstream mortality of juveniles and pre-spawning adult mortality caused by dams on MSY spawning escapement

The normal condition for dam passage is for losses both for juveniles during their downstream migration and for adults during their upstream migration. In this instance, MSY spawning escapement is found by maximizing:

(10)

$$MSY \cdot (DS_j \cdot e^{a \cdot (1 - \frac{MSY}{b})} - \frac{1}{DS_a})$$

This is equivalent to solving the transcendental equation:

(11)

$$e^{a \cdot (1 - \frac{MSY}{b})} \cdot (1 - \frac{a \cdot MSY}{b}) = \frac{1}{DS_j \cdot DS_a}$$

The value on the right hand side of equation (11) is greater than 1 when there is some dam passage mortality. Since the sustainable exploitation rate decreases as escapement increases, MSY for the population with dams must lie to the left of the MSY for the population with no dams. The combined effect of downstream mortality of juveniles and upstream mortality of adults is depicted in figure 3.

Effect of both downstream mortality of juveniles and pre-spawning adult mortality caused by dams on escapement past fisheries to achieve MSY

The issue of escapements required to achieve MSY can be viewed from another perspective. Equations (10) and (11) provide the generalized formulas appropriate for estimation of MSY spawning escapement. Corresponding equations for estimation of escapement past fisheries to achieve MSY are presented below:

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Escapement past fisheries to achieve MSY is found by maximizing:

(12)

$$MSY_i = (DS_s \cdot DS_i \cdot e^{a \cdot (1 - \frac{DS_s \cdot MSY_i}{b})} - 1)$$

where:

MSY_i = Escapement past fisheries to achieve MSY

This is equivalent to solving the transcendental equation:

(13)

$$e^{a \cdot (1 - \frac{DS_s \cdot MSY_i}{b})} \cdot (1 - \frac{a \cdot DS_s \cdot MSY_i}{b}) = \frac{1}{DS_i \cdot DS_s}$$

The values on the right hand sides of equations (11) and (13) are identical. Since DS_i must be no larger than 1, then the value of MSY_i must be at least as large as MSY, i.e. to maximize yield, the escapement past fisheries must be larger than the MSY spawning escapement.

Relationships between spawning escapements and escapements past fisheries and production, sustainable yield, and sustainable exploitation rate are compared in figures 4, 5, and 6, respectively.

SUSTAINABLE EXPLOITATION RATES

The sustainable rate of exploitation at any given level of spawning escapement for a population with dam passage mortality can be generally expressed as (a population with no dam mortality is represented by setting both DS_i and DS_s equal to 1):

(14)

$$SER_S = 1 - \frac{e^{-a \cdot (1 - \frac{S}{b})}}{DS_i \cdot DS_s}$$

where:

SER_S = Sustainable Exploitation Rate at Escapement S.

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Rearranging, the level of spawning escapement given a sustained rate of exploitation can be computed as:

(15)
$$S = b \cdot \frac{a + \ln((1 - SER_s) \cdot DS_i \cdot DS_j)}{a}$$

The sustainable exploitation rate increases as the spawning escapement decreases. The maximum sustainable rate is:

(16)
$$MaxSER = 1 - \frac{e^{-a}}{DS_i \cdot DS_j}$$

MAXIMIZING SUSTAINED YIELD FROM A COMPOSITE POPULATION

In the Elwha system, sustainable yields are likely to differ for the populations below the Elwha Dam, between the Elwha and Glines Dams, and Above the Glines Dam. Equation (15) can be used to estimate the maximum sustainable yield from a composite population consisting of segments that are subject to different dam mortality losses.

Assume that: (1) each of the populations is adequately seeded; and (2) all harvest occurs when the populations are commingled. Then follow the following search procedure:

a. Select a sustainable exploitation rate (SER).

b. Using equation (15) for each population segment, determine the sustainable spawning escapements associated with the SER.

c. Compute the sustainable yield separately for each population segment and then sum to determine the sustainable yield from the composite population.

d. Repeat procedure until the SER that maximizes the sustainable yield from the composite population is found.

In theory, the spawning escapement for each population segment spawning should stabilize if the SER and dam mortalities are kept constant over time.

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COHORT ANALYSIS FOR ELWHA STOCKS

"Cohort analysis"[2] of coded-wire-tag (CWT) data is proposed to be employed to estimate the catch distributions and exploitation rates of Elwha stocks. A list of available tag codes that could be used in the analysis is attached as Appendix A. There are several major problems with the CWT data that must be overcome:

1. The size of individual CWT release groups was normally much smaller than considered necessary for reliable analysis.

   Proposed approach: Combine CWT release groups into a super tag group for each release type within brood years; use equal weights between brood years.

2. CWT release groups were designed to address various experiments, such as dam passage mortality and volitional release strategies.

   Proposed approach: Consider only production and experimental/production releases.

3. Both fingerling and yearling chinook were frequently tagged with the same CWT code.

   Proposed approach: Research CWT history and consider only "pure" fingerling releases of chinook to represent natural production.

4. Sampling of escapement for CWT's was inconsistent. These data are essential for analysis of exploitation rates. Reported hatchery rack recoveries include tags removed from fish gaffed for broodstock (gaffing was selective for females which would tend to be older and larger than the general population).

   Proposed approach: Either: (a) obtain raw tag recovery data to separately identify CWT's recovered at hatchery rack from voluntary returns and gaffing and expand for hatchery stray rates; or (b) expand CWT recoveries at hatchery rack to compensate for average stray and gaffing rates as reported in the most recent state/tribal reports.[3]

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[2] Procedures are generally described in Appendix II, Supplement B, Pacific Salmon Commission Joint Chinook Technical Committee Report (88)-2, October 31, 1988.

[3] e.g. "1990 Puget Sound Summer/Fall Chinook Forecasts and Management Recommendations", prepared by the Washington Department of Fisheries, Puget Sound Treaty Indian Tribes, and the Northwest Indian Fisheries Commission, September 1990.

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ESTIMATION OF CATCH IN NUMBERS OF FISH

Adult equivalent production is converted to the actual number of age 1 recruits using the following procedure: (1) estimate the probability that a fish will survive to spawn at any age in the absence of fishing mortality by accumulating the survival rates by age multiplied by the maturation rate by age; (2) divide adult equivalent production by this probability.

Cohort analysis procedures provide estimates of age-specific fishery exploitation rates.

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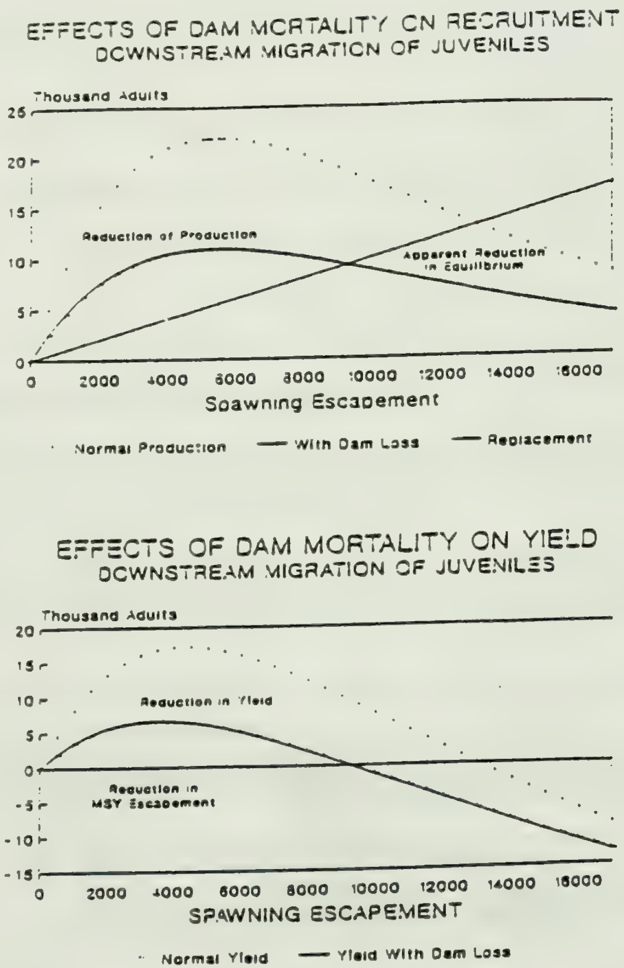

Figure 1

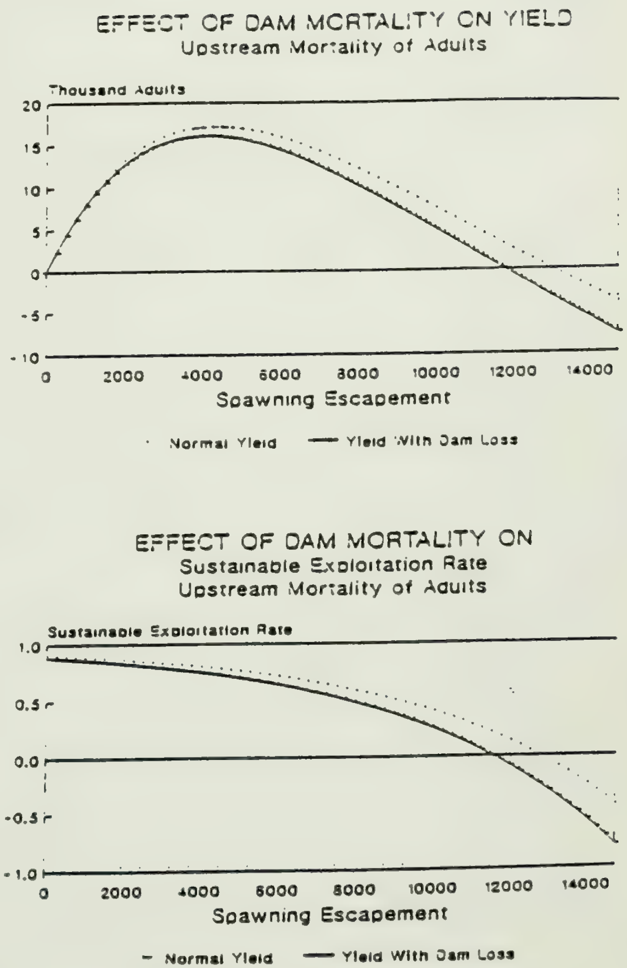

Figure 2

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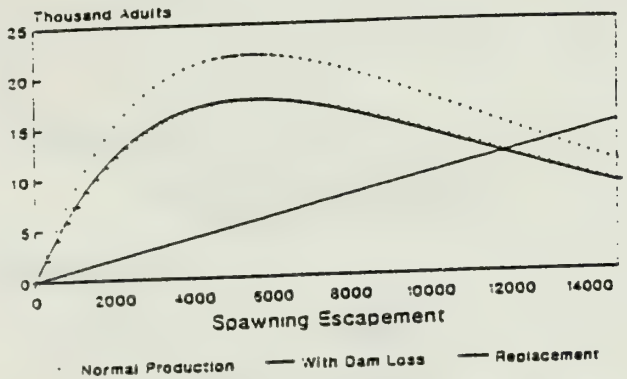
EFFECT OF DAM MORTALITY ON RECRUITMENT
Downstream & Upstream Mortality



EFFECT OF DAM MORTALITY ON YIELD
Downstream & Upstream Mortality

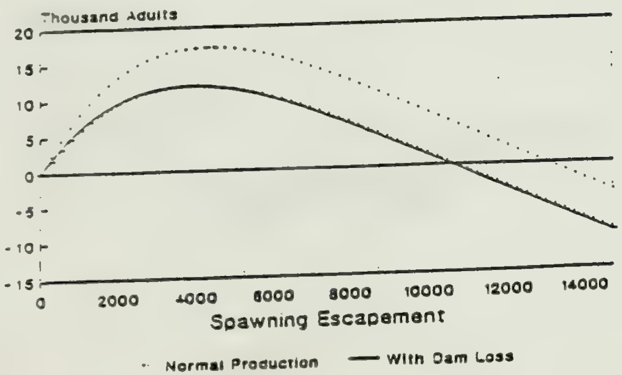
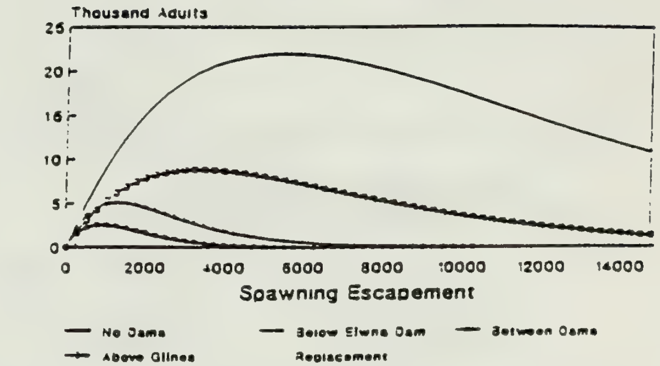


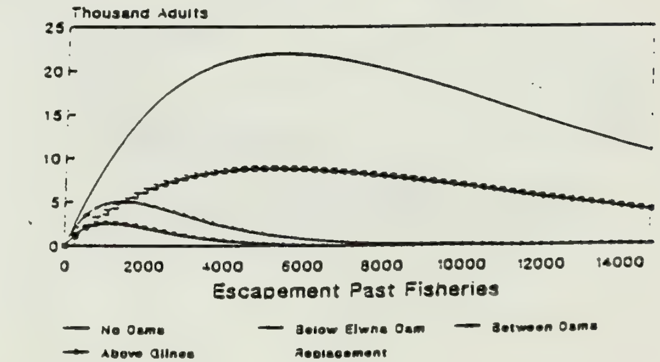
Figure 3

PRODUCTION FROM
Spawning Escapement



Hypothetical Example Only

PRODUCTION FROM
Escapement Past Fisheries



Hypothetical Example Only

Figure 4

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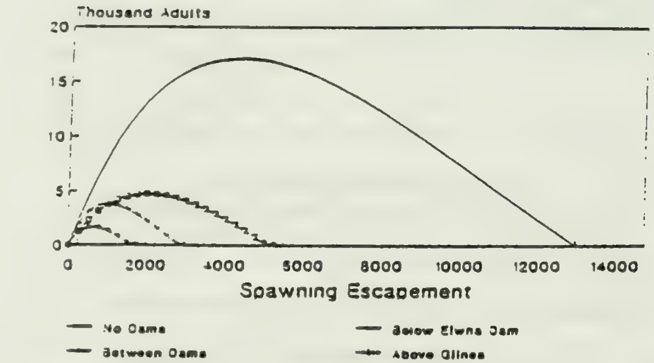
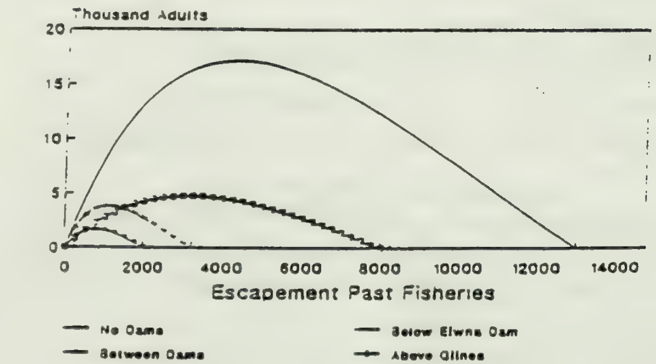
SUSTAINABLE YIELD
Spawning Escapement



Hypothetical Example Only

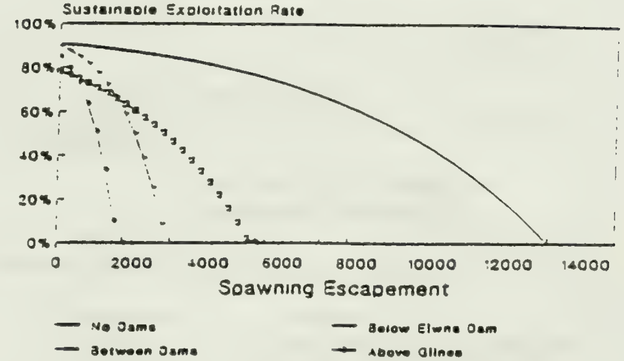
SUSTAINABLE YIELD
From Escapement Past Fisheries



Hypothetical Example Only

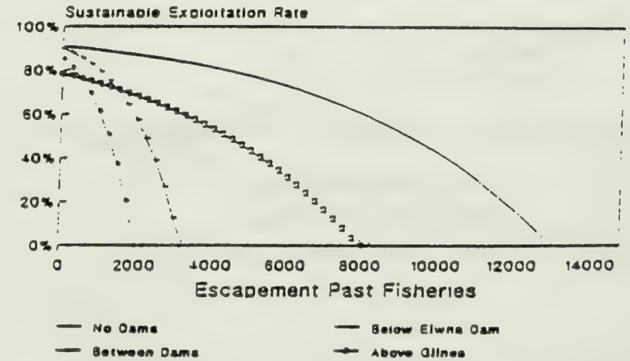
Figure 5

SUSTAINABLE EXPLOITATION RATE
Spawning Escapement



Hypothetical Example Only

SUSTAINABLE EXPLOITATION RATE
From Escapement Past Fisheries



Hypothetical Example Only

Figure 6

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APPENDIX IV

COHORT ANALYSIS FOR CHINOOK AND COHO SALMON

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EXHIBIT

APPENDIX V

OTHER STAFF MEMORANDUM REGARDING METHODOLOGY

EXHIBIT

NRC

Natural Resources Consultants, Inc.

4055 21st AVENUE WEST
SEATTLE, WASHINGTON 98199, U.S.A.
TELEPHONE: (206) 285-3480
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June 3, 1991

MEMORANDUM

To: NRC Elwha Project Staff and Dr. Gary Morishima

From: Jeff June

Subject: Final CWT Run for Elwha Coho and Chinook Interceptions

Attached are the final runs from the CWT data supplied by Gary. There are some minor changes from the previous run. As Gary has mentioned in his discussion of the methods of CWT analysis, it is very important to remember that savings in the harvest of Elwha fish in one fishery may be passed on to another fishery along the homeward migration route and do not necessarily equate to additional fish for spawner escapement or harvest in the terminal fishery. Also it is important to note that these analyses must be based on constant harvest patterns as represented by the period of time the CWT data was collected.

Given these basic assumptions, it is still evident that some fairly severe restrictions in exploitation rate for both species will be necessary during the restoration period and that at MSY further severe restrictions will be necessary for coho salmon to reduce the exploitation rate down from the 80 to 90% currently to the 58 to 65% exploitation rate necessary for either dams in or dams out scenarios.

Weights of salmon harvested in each fishery are calculated from length-weight relationships applied to mean lengths in the CWT data by fishery, area, and tag group. The length weight relationships were supplied by Gary Morishima (see Morishima memo of May 30th) and are from Ricker (1976) for chinook and Mathews and Ishida for coho. The following tables provides mean weights used for each species, and area/fishery:

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Elwna Cono Mean Weights

Areas	Average Wt (lbs)
SE Ak Troll	7.3
Ore Troll	5.4
Wa Ocean Troll	5.5
N B.C. Troll	7.6
N W Van Troll	5.8
Ilwaco Troll	3.2
S C Van Troll	5.7
S W Van Troll	5.3
Grays Har Net	8.8
Oth Pug S Net	7.9
N Pug S Net	6.0
US Juan Net	8.5
Terminal Net	7.3
Can Juan Net	6.1
Johnson St Net	7.2
S W Van Net	7.1
Ore Sport	4.4
La Push Sport	6.5
Neah Sport	5.2
US Juan Sport	6.1
Overall	6.5

Elwha Chinook Salmon Mean Weight

Area	Mean Wt (lbs)
WC Van Troll	13.3
Terminal Net	22.5
Ak Troll	14.5
WaOr Troll	8.6
NC Van Troll	12.2
N Van Troll	16.3
Can BC Troll	11.0
Oth Pug Net	7.5
N Pug Net	16.7
C BC Net	5.0
Geo St Net	4.6
Can Juan Net	3.7
Jnst Net	3.6
N BC Net	5.1
WC Van Net	4.6
Wa Ocean Net	4.9
Ak Net	10.7
Ak Sport	10.7
WaOr Ocean Sport	10.4
Oth Pug Sport	6.2
N Pug Sport	21.1
Overall	14.3

Attached is a list of the Area/Fishery code definitions used in the above analyses.

Definitions of Area/Fishery Codes

Area Code	Area/Fishery Definition
Ak Net	Alaska Net Fisheries
Ak Sport	Alaska Sport Fisheries
Ak Troll	Alaska Troll Fisheries
C BC Net	Central British Columbia Net Fisheries
Can Juan Net	Canadian Strait of Juan de Fuca Net Fisheries
Can BC Troll	Central British Columbia Troll Fisheries
Geo St Net	Georgia Strait Net Fisheries
Grays Har Net	Grays Harbor Net Fisheries
Ilwaco Troll	Ilwaco Troll Fisheries
Jnst Net	Johnston Strait Net Fisheries
Johnson St Net	Johnston Strait Net Fisheries
La Push Sport	La Push Sport Fisheries
N B.C. Troll	Northern British Columbia Troll Fisheries
N BC Net	Northern British Columbia Net Fisheries
N Pug Net	Northern Puget Sound Net Fisheries (including Strait of Juan de Fuca)
N Pug S Net	Northern Puget Sound Net Fisheries (including Strait of Juan de Fuca)
N Pug Sport	Northern Puget Sound Sport Fisheries (including Strait of Juan de Fuca)
N Van Troll	Northern Vancouver Island Troll Fisheries
N W Van Troll	Northwest Vancouver Island Troll Fisheries
NC Van Troll	North-Central Vancouver Islands Troll Fisheries
Neah Sport	Neah Bay Sport Fisheries
Ore Sport	Oregon Sport Fisheries
Ore Troll	Oregon Troll Fisheries
Oth Pug Net	Other Puget Sound Net Fisheries (all expect North Puget Sound and Strait of Juan de Fuca)
Oth Pug S Net	Other Puget Sound Net Fisheries (all expect North Puget Sound and Strait of Juan de Fuca)
Oth Pug Sport	Other Puget Sound Sport Fisheries (all expect North Puget Sound and Strait of Juan de Fuca)
Overall	All Areas Combined
S C Van Troll	South-Central Vancouver Island Troll Fisheries
S W Van Net	South-West Vancouver Island Net Fisheries
S W Van Troll	South-West Vancouver Island Troll Fisheries
SE Ak Troll	Southeast Alaska Troll Fisheries
Terminal Net	Elwha River Tribal Terminal Net Fisheries
US Juan Net	U.S. Juan de Fuca Net Fisheries
US Juan Sport	U.S. Juan de Fuca Sport Fisheries
Wa Ocean Net	Washington Ocean Net Fisheries
Wa Ocean Troll	Washington Ocean Troll Fisheries
WaOr Ocean Sport	Washington and Oregon Ocean Sport Fisheries
WaOr Troll	Washington and Oregon Ocean Troll Fisheries
WC Van Net	West Coast Vancouver Island Net Fisheries
WC Van Troll	West Coast Vancouver Island Troll Fisheries

EXHIBIT

MEMORANDUM

TO: Files

FR: Gary S. Morishima

RE: Estimation of CWT's in Elwha Spawning Escapements

DATE: May 23, 1991

CHINOOK

Kent Dimmit of WDF Salmon Culture provided data on 1985-1989 recoveries of CWTs, separated by recoveries from voluntary returns to hatchery rack and from brood stock gaffing. Data for the CWT groups employed in the cohort analysis are summarized below.

CODE	Year	Rack Returns	Gaffed Fish	Estimated CWT in Escapement
051363	1985	14	16	122
	1986	25	25	203
BY 82	1987	5	5	41
632602	1985	9	12	85
	1986	26	11	152
BY 81	1987	1		4
633038	1985	1		4
	1986	9	1	41
BY 83	1987	13	7	82
	1988	4	2	25
633039	1985	2		8
	1986	8		33
BY 83	1987	13	9	90
	1988	6	5	45
633421	1988	7		29
BY 84	1989	3	1	16
633422	1988	5		21
BY 84	1989	1	1	8
211658 BY 84	1988	2		8
211616	1986	2		8
BY 83	1987	2	3	20

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These recovery estimates were then expanded by the 1982-89 average proportion of the terminal run that returns to the hatchery rack and the average proportion of the spawning population that was gaffed for broodstock.

Calculation of Hatchery Rack Recoveries:

Terminal Run
- Test Fishery Catches
x .89 (PreSpawning Survival '82-85, '88, & '89 avg)
x .271 (Proportion of run returning to hatchery rack)
= Hatchery rack recoveries

Calculation of Recoveries From Gaffing:

Terminal Run
- Test Fishery Catches
x .89 (PreSpawning Survival '82-85, '88, & '89 avg)
x (1-.271) (Proportion of population remaining after hatchery rack returns)
x .39 (Proportion of remaining run gaffed for broodstock '86-87 avg)
= Gaff Recoveries

To estimate the number of CWT's returning to the river after the test fishery, rack and gaff recoveries were expanded by dividing recoveries by the following values:
Rack: .89 x .271 = .241

Gaffed: .89 x (1-.271) x .39 = .251

i.e. each rack recovery represents 1/.241 = 4.149 cwt's in escapement

each gaff recovery represents 1/.251 = 3.984 cwt's in escapement

Where data for individual years were not available from Dimmit, reported escapement estimates in the PSMFC data base were expanded by a factor of four. Note that escapement recoveries contained in the PSMFC database did not correspond to data provided by Dimmit. Given the uncertainty regarding completeness of reporting of escapement estimates, data provided by Dimmit were used wherever possible.

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Values for rack return rates, prespawning mortality, and gaffing rates were extracted from:

1990 Puget Sound Summer/Fall Chinook Forecasts and Management Recommendations, Joint Report Prepared By: Washington Department of Fisheries, Puget Sound Treaty Indian Tribes, and the Northwest Indian Fisheries Commission, September 1990, p 8-9.

NOTES REGARDING ESTIMATION OF CWT ESCAPEMENTS FOR COHO

No data are available for CWT recoveries in spawning escapements for the Elwha system for the BY 85-86 tag codes used for cohort analysis. CWT's in escapements were estimated by the following procedure:

Terminal fishery recoveries
/ Estimated terminal harvest rate from WDF run reconstruction

= Terminal area returns of CWT's
- Terminal fishery recoveries

= Estimated CWT's in spawning escapement (assumes no prespawn mortality)

Values for rack return rates, prespawning mortality, and gaffing rates were extracted from:

1990 Puget Sound Summer/Fall Chinook Forecasts and Management Recommendations, Joint Report Prepared By: Washington Department of Fisheries, Puget Sound Treaty Indian Tribes, and the Northwest Indian Fisheries Commission, September 1990, p 8-9.

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APPENDIX VI

ECONOMIC VALUATION OF ALTERNATIVES

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ECONOMIC VALUATION OF ALTERNATIVES

Methodology

Valuation of commercial catches is straightforward. Following accepted practice, values of harvests are measured at the ex-vessel level. Prices are expressed in terms of round weight, and are recorded separately by area and gear type. Canadian prices are used to value Canadian catches, and are converted to U.S. prices at the current exchange rate ($.86 US=$1.00 C).

Canadian values are included because of their importance in total harvests of Elwha salmon and because the mechanics of the U.S. / Canada treaty provide, at least in theory, for adjustments to recognize changes in contributions of each country.

Good economic practice requires that changes in benefits be measured net of resulting effects on costs. Thus, if an increase (decrease) in catches results from removing the dams, the resulting change in gross harvest values should be reduced by the induced change (if any) in operating costs. In the case of salmon fisheries, however, this adjustment is needed only if the change is large enough to draw more boats into operation or to extend permitted fishing areas or time. Since the Elwha contributes such a small part of the mixed stock catches involved, these changes are most unlikely. Therefore, gross ex-vessel prices are a very close approximation to net economic effect of changes in harvests of Elwha fish; such changes simply affect the amounts harvested by a given amount of fishing effort.

Catch data for the present situation and for the dams in (no hatchery) and dams out scenarios are taken from preceding sections of this report. U.S. prices by area and gear type are taken from state fishery agencies of Alaska, Washington and Oregon. Canadian prices were provided by the Department of Fisheries and Oceans. It is assumed that steelhead catches will be divided equally between tribal and sport fisheries. The former are valued at commercial ex-vessel prices. Chinook"available over harvest" in the dams out case are assumed to be harvested in the terminal net fishery.

Present values of harvests under present conditions and under the dams in and dams out scenarios assume a fifty year horizon and discount rates of 3%. Constant real prices and a real discount rate are used for consistency. For the dams out option it is assumed that production at full MSY will resume twelve years after removal of the dams. Obviously it would be more accurate to model a rising time path of harvests starting with the initial recovery dates, but the data to do so simply don't exist. The use of twelve years assumes that MSY production will resume after several spawning, out-migration, and ocean-feeding cycles have been completed by the subject species. Full restoration to MSY may or may not have occurred by this time but we consider the twelve year period a reasonable cut-off point for purposes of this analysis. The long lag between removal of the dams and

achievement of full natural productive capacity has a very large impact on present values, even at relatively low discount rates.

RECREATIONAL FISHERIES

Sport fisherman in Canada and the U.S. take a fairly significant part of the coho, chinook, and steelhead harvests. Unfortunately the difficulties of measuring the economic value of this activity in terms comparable to that generated by the commercial fishery are virtually insuperable.

First, the "output" of a sport fishery is not fish but the fishing experience, and the appropriate unit of measurement is the fishing day or fishing trip. To measure the impact of a change in the number of fish available to sport fisherman requires data on the effect of changes in catch per day and, most important, on the effect of that perceived change on numbers of participants, days fished, and pleasure derived from expectations of a better (or worse) catch per day. In short, there is no satisfactory way to translate more or fewer fish into a measurable change in the value of an angler day.

Second the Elwha contributes to several large sport fisheries (principally in Georgia Strait, Neah Bay, and Strait of Juan de Fuca areas) all of which operate on mixed stocks from many river systems. The Georgia Strait fishery has recently generated 500,000 to 600,000 boat trips per year, with well over 1 million angler days. Angler trips from Neah Bay and the Straits areas of Washington ranged from 230,000 to 340,000 from 1986-1988. It is obvious that even the largest changes in catches from Elwha stocks will be almost invisible in the eyes of the sportsman. Thus, no change in participation or in permitted fishing days will be induced by either dam in or dam out proposals. The lone exception would be the change in in-river fishin - downward for coho and steelhead and upward for chinook-(after the, recovery period).

Not addressed in this report due to lack of data is the potential effect on present resident trout sportfisheries which occur throughout the Elwha River. Under either the dams-in or dams-out proposals resident trout sportfisheries would likely be negatively impacted in the upper river above the dam sites by management options implemented to protect salmon and steelhead smolts (minium size limits or time/area closures) and from reduced resident trout production due to rearing competition with wild salmon and steelhead stocks.

The values given for the sport fishery in the tables are derived from data in the 1988 study of salmon values in Washington (Department of Community Development, 1988). They represent our best effort to translate value per angler day to value per fish and are stated in terms of net willingness-to-pay. G. Brown's study[1] of per fish values for steelhead yields a value per fish more readily since it compared willingness-to-pay in locations with different catch rates.

The fact that these values are less precise than those for commercial catches is mitigated by the important conclusion above that changes in sport catches of Elwha fish will have little visible effect on angler participation in the important Neah Bay/ Straits salmon fisheries. The only important changes in net value and possible community impact will be the decline in the in-river coho, steelhead and resident trout harvest and the delayed increase in chinook available to tribal and in-river sport fisheries.

This conclusion is buttressed by the preliminary findings of a study of British Columbia sport salmon fishing, which indicated that even fairly substantial changes in catch quotas would result in only minor changes in fishing effort. In short, any change in catches of Elwha salmon would be spread over so many anglers and over such a wide geographic area that it would have no perceptible effect on expected catch per day of any one fisherman.

IMPACT ON INDIAN FISHERIES

As indicated earlier in this report, the harvest of Elwha coho must be reduced sharply even under the dams in option and the only feasible way to achieve harvest rates consistent with MSY is to eliminate the terminal fishery. The cost of that measure and the elimination of hatchery contributions to U.S. catches of coho and Indian steelhead catches is estimated at nearly $2.8 million (dams-in) or $3.2 million (dams-out) in present value terms. Adding to these costs would be the eventual elimination of the LET hatchery which employs four persons and in 1987 had an operating budget of $140,000.4 Set against this is the long term gain in chinook available to a terminal fishery under the dams out scenario. The gain is, however, sharply reduced by the long delay before full natural production can be realized. The present value of that gain would be about $1.3 million. Since the tribal catch of coho must be reduced or eliminated under either scenario, it is clear that the Indian fishermen face a severe loss of current and future income during the recovery period in order to realize long deferred gains in chinook catches.

[1]Brown, G.B. and Robert Mendelsohn, "Hedonic Demand Functions with Linear and Non-Linear Budget Constraints," University of Washington, Department of Economics, Discussion Paper No. 81-12, November 1981.

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Appendix Table VI.1: Value of Elwha River salmon and steelhead harvest under current river management conditions. Source: CWT data.

Species	Fishery	Number of Fish Harvested	Total Weight of Fish Harvested	Price per Pound (US$)	Total Value of Fish Harvested
CHINOOK					
	AK Troll	1,054	15,253	$2.10	$32,031
	AK Net	63	671	$1.20	$805
	BC Troll	2,520	33,656	$2.10	$40,387
	BC Net	1,040	4,765	$1.37	$6,528
	WA/OR Troll	339	2,900	$2.02	$5,858
	Puget Sound Net	1,323	15,743	$1.54	$24,244
	Terminal Net	11	254	$1.54	$391
	TOTAL	6,350	73,242		$110,244
COHO					
	AK Troll	137	1,002	$1.12	$1,122
					$104
	BC Troll	7,381	40,464	$1.45	$58,673
	BC Net	780	5,222	$0.97	$5,065
	OR Troll	519	2,785	$1.25	$3,481
	Ilwaco Troll	26	82	$2.02	$165
	Neah Bay Troll	778	4,283	$2.02	$8,652
	Grays Harbor Net	8	70	$1.49	$104
	U.S. Juan de Fuca Net	899	7,660	$1.51	$11,566
	Other Puget Sound Net	727	5,756	$1.49	$8,576
	Terminal Net	5,605	43,529	$1.49	$64,858
	TOTAL	16,723	109,581		$161,140
SPORT-COHO					
	BC Sport	1,479			
	OR Sport	127			
	WA Coastal Sport	79			
	U.S. Juan de Fuca Sport	523			
	TOTAL	2,208		$40.00 (1)	$88,320
SPORT-CHINOOK					
	AK Sport	18			
	BC Sport	1,173			
	WA Sport	2,070			
	TOTAL	3,261		$45.00 (1)	$146,745
STEELHEAD					
	Indian	1,800	2,600	$1.07	$13,482
	Sport	1,800		$125.00 (1)	$225,000
	TOTAL	3,600			$238,482
TOTAL ALL SPECIES AND FISHERIES		32,143	182,823		$744,931

(1) Price per fish.

Appendix Table VI.2: Value of Elwha River salmon and steelhead harvest under two proposed river management alternatives.

Species	Fishery	Dams In	Dams Out
CHINOOK			
	AK Troll	$28,892	$55,413
	AK Net	$726	$1,392
	BC Troll	$36,429	$69,870
	BC Net	$5,888	$11,293
	WA/OR Troll	$5,284	$10,134
	Puget Sound Net	$21,868	$41,942
	Terminal Net	$353	$676
	HARVEST TOTAL VALUE	$99,440	$190,720
	VALUE OF EXCESS AVAILABLE FOR HARVEST	$18,781	$124,996
	GRAND TOTAL	$118,221	$315,716
COHO			
	AK Troll	$707	$833
	BC Troll	$36,964	$43,535
	BC Net	$3,191	$3,758
	OR Troll	$2,193	$2,546
	Ilwaco Troll	$104	$122
	Neah Bay Troll	$5,451	$6,420
	Grays Harbor Net	$66	$77
	U.S. Juan de Fuca Net	$7,287	$8,582
	Other Puget Sound Net	$5,403	$6,363
	Terminal Net	Eliminated	Eliminated
	TOTAL	$60,659	$71,403
SPORT-COHO		$55,641	$65,001
SPORT-CHINOOK		$176,675	$251,820
STEELHEAD			
	Indian	$5,408	$10,591
	Sport	$90,250	$178,500
	TOTAL	$95,658	$189,091
TOTAL ALL SPECIES AND FISHERIES		$506,854	$893,031

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DRAFT
STAFF REPORT

MEMORANDUM

TO: Lee Alverson

FR: Gary S. Morishima

RE: FINAL Cohort Analysis For Coho and Chinook

DATE: June 3, 1991

Attached are final results of cohort analysis performed on CWT data for Elwha coho and chinook.

Incidental fishing mortality loss for coho has been incorporated into the fishery distribution table 1, using rates employed for analysis of PFMC ocean fishing regulations (i.e. 5% of legal catch for hook and line fisheries and 2% for net fisheries).

Results for chinook have changed due to incorporation of the CWT data received last week and reassessment of incidental fishing mortality loss.

Catch distributions for coho and chinook are provided for your reference as tables 1 and 2, respectively.

Notes of significance:

1. Catch distribution tables are appropriate for use only when assuming that fishing patterns do not change (i.e. comparing catch values at different levels of sustainable production). If values are to be estimated under alternative regulatory measures that may be implemented to manage Elwha chinook and coho for natural production, these distributions of catch (and, implicitly, incidental mortality loss) would of course change.

2. Estimated exploitation rates (catch plus incidental fishing mortality loss) for coho are extremely high, ranging from 83% for the 1985 brood year to over 92% for the 1986 brood year. If current estimates of productivity for the Elwha stock are correct, these rates cannot be sustained over the long term. Under management for natural production, substantial reductions would be necessary under both the dam/no dam scenarios.

   Incidental fishing mortality loss for coho is estimated to comprise approximately 3.6% of the total fishing mortality.

3. The estimated adult equivalent exploitation rate for chinook is approximately 64% for a composite population represented by the 1981 through 1984 broods.

   For chinook, in numbers of fish, incidental (non-catch) mortality loss amounts to 33% of the landed catch. In adult equivalent terms, incidental mortality represents approximately 16% of the total fishing mortality. This is somewhat lower than that reported earlier since it represents only the results of direct cohort analysis on raw

CWT recovery data (cohort analysis procedures are identical to those employed by the Pacific Salmon Commission's Chinook Technical Committee). Key assumptions involved in these procedures are: (i) all natural mortality occurs prior to the start of each fishing season; (ii) age-specific mortality schedules are fixed and identical for all stocks; (iii) populations of chinook of the same ocean age have the same underlying size distribution for all stocks; (iv) incidental fishing mortality loss can be estimated directly from the proportion of each ocean age class that is below the size limit established for a fishery or vulnerable to a given gear type; and (v) size limits remain constant.

Estimates of incidental mortality loss in adult equivalent terms has been reduced from that calculated earlier because of these reasons:

(a) the initial calculations were performed including allowances for continuation of large chinook non-retention fisheries in S.E. Alaska and Canada. Non-retention fisheries during the late 1980's were excessively large due to abnormally high survival rates of the 1983 and 1984 broods of some large stocks (e.g. Columbia River bright). The magnitude of future non-retention fisheries is uncertain. The Pacific Salmon Commission is attempting to develop methods to adjust fishing regimes for short-term variations in abundance and reduce wastage due to non-catch mortalities.

(b) the initial calculations reflected a one-time increase in the size limits for Canadian troll and sport fisheries which occurred in 1987, during the middle of the CWT data collection period. Impacts of this one-time adjustment should be eliminated; and

(c) results are more easily defended since they are readily reproduced from CWT recovery and escapement data without use of the speculative assumptions involved in (a) and removal of one-time impacts associated with (b).

A value of 16% for adult equivalent mortality loss is at the low end of the range that is considered the "normal" for chinook stocks[1]. However, I think this value would be more appropriate since it does not carry the "baggage" of speculation regarding future management actions in Canada and S.E. Alaska. Actual mortality losses in the future could of course turn out to be higher than 16%. The important factors to emphasize, however, are that the DEIS did not consider incidental fishing mortality loss at all and the DEIS did not make the necessary adjustments from adult equivalents to actual catches in numbers of fish.

[1] In numbers of fish, incidental fishing mortality loss for chinook generally ranges from 30% to 50% of the landed catch (for all stocks combined). For individual chinook stocks, adult equivalent incidental fishing mortality generally ranges from 18% to 40% of the total fishing mortality. The primary factors that determine incidental fishing mortality loss for a given stock is the age-specific pattern of contribution to fisheries and age-specific abundance relative to other stocks taken in the fishery.

4. As expected, impacts of Canadian fisheries on these stocks are extremely high. Nearly 60% of the total fishing mortality for coho and chinook is accounted for by Canadian fisheries. Alaskan fisheries also have a substantial impact on Elwha chinook.

These distribution patterns indicate that Washington treaty and nontreaty fisheries will have very limited flexibility if Elwha chinook and coho are to be managed for natural production.

5. I have recently incorporated an Elwha chinook stock into the Pacific Salmon Commission (PSC) chinook model. Since the model is designed to assess impacts of the coastwide chinook rebuilding program undertaken by the U.S. and Canada, it might be helpful if you wish to include assessments of future PSC fisheries management actions on the Elwha stock in your analysis. Impacts could be significant for economic analysis since the distribution pattern would be expected to shift over time: interceptions by Alaskan and Canadian fisheries would decrease while spawning escapements and catches in Washington would increase. If you are interested in examining the potential effect of dam removal or the restoration proposal on the Elwha stock over time, the model code would have to be modified. Such changes would not be trivial and it is unlikely that they could be completed within the time frame currently available for analysis.

Lastly, I will be in Portland all this week. I can be reached through the Bureau of Indian Affairs Portland Area Forestry Office (502)231-6801; I will be attending the meetings of the Intertribal Timber Council which are being held in the 7th floor conference rooms.

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Table 1. CATCH DISTRIBUTION PATTERN FOR ELWHA COHO

AREA	BY 85 211941	BY 86 031908	BY 86 212236	<--RECOVERIES--> BY 85 AVG	BY 86 AVG	CATCH PER 1000 MORTS
SE ALASKA TROLL		1	30	0.00000	0.01382	6.9
	0	1	30	0.00000	0.01382	6.9
NORTHERN B.C. TROLL		3	36	0.00000	0.01680	8.3
SOUTH CENTRAL B.C. TROLL		20	6	0.00000	0.01160	5.8
NW VANC IS TROLL	8	177	219	0.04196	0.17660	109.3
SW VANC IS TROLL	48	259	295	0.25177	0.24707	249.4
SW VANC IS NET		25	36	0.00000	0.02720	13.6
WC VANC IS SPORT			4	0.00000	0.00178	0.9
JOHNSTONE STR NET			8	0.00000	0.00357	1.8
CAN JUAN DE FUCA NET	3	31	46	0.01574	0.03434	25.3
GEO STRAIT SPORT	16		163	0.08392	0.06377	73.8
	75	515	791	0.39339	0.38243	487.9
US JUAN DE FUCA NET	2	25	155	0.01049	0.08027	45.4
US JUAN DE FUCA SPORT	3	23	60	0.01574	0.03702	26.6
OTHER PUGET SOUND NET	11	7	28	0.05770	0.01561	36.7
GRAYS HARBOR NET			2	0.00000	0.00089	0.4
NEAH BAY SPORT		8	8	0.00000	0.00716	3.6
NEAH BAY TROLL	12	3	32	0.06294	0.01561	39.3
LA PUSH SPORT			1	0.00000	0.00045	0.2
GRAYS HARBOR SPORT			1	0.00000	0.00045	0.2
ILWACO TROLL			6	0.00000	0.00268	1.3
OREGON OCEAN TROLL	10			0.05245	0.00000	26.2
OREGON OCEAN SPORT	2		5	0.01049	0.00223	6.6
	40	46	298	0.20981	0.16233	186.1
ELWHA RIVER NET	69	188	270	0.36192	0.20425	283.1
	69	188	270	0.36192	0.204252	283.1
TOTAL FISHERY RECOVERIES	184	770	1389	0.96512	0.96284	964.0
ALASKAN	0	1	30			
CANADIAN	75	515	791			
WASHINGTON MARINE	28	46	293			
OREGON	12	0	5			
WASH FRESHWATER	69	188	270			
INCIDENTAL FISHING MORTALITY	6.63	30.22	53.10			
TERM RUN HARV RATE	0.664	0.700	0.700			
EST CWT IN ESC	38	81	116			
TOTAL EST EXP RATE	0.834	0.908	0.926			
OCEAN EXP RATE	0.526	0.691	0.749			
TERMIN EXP RATE	0.308	0.218	0.177			

TO ESTIMATE CATCH, BY FISHERY MULTIPLY SUSTAINED YIELD (1000's) BY VALUES IN LAST COLUMN.

Table 2. CATCH DISTRIBUTION PATTERN FOR ELWHA CHINOOK
Total Adult Equivalent Exploitation Rate: 64.34%,
based on fingerling releases for the 1981 through 1984 broods

CATCH IN NUMBERS OF FISH PER 1000 ADULT EQUIVALENT MORTALITIES (CATCH + INCIDENTAL LOSS)

AREA	GEAR	Age 2	Age 3	Age 4	Age 5	Age 6	ALL AGES	
ALASKA	TROLL	0.000	32.009	51.415	21.641	0.349	105.413	
ALASKA	NET	0.000	2.792	3.491	0.000	0.000	6.283	
ALASKA	SPORT	0.000	1.396	0.349	0.000	0.000	1.745	
	SUBTOTAL	0.000	36.197	55.254	21.641	0.349	113.441	12%
NORTH BC	TROLL	0.000	9.426	14.660	2.443	0.000	26.528	
CENTRL BC	TROLL	0.000	4.538	19.896	2.443	0.000	26.877	
WCVI	TROLL	0.000	72.402	110.998	12.915	0.000	196.315	
GEO ST	TROLL	0.000	0.000	2.094	0.000	0.000	2.094	
NORTH BC	NET	11.519	17.802	2.792	0.000	0.000	32.113	
CENTRL BC	NET	4.189	20.394	1.047	0.000	0.000	25.630	
WCVI	NET	3.141	9.075	2.443	1.745	0.000	16.405	
J DE F SC	NET	9.424	11.519	1.047	0.000	0.000	21.990	
JNST STR	NET	6.283	0.349	1.047	0.000	0.000	7.679	
FRASER	NET	0.000	0.000	0.000	0.000	0.000	0.000	
NTH/CENT BC	SPORT	0.000	0.349	8.726	0.000	0.000	9.075	
WCVI	SPORT	2.792	17.103	10.122	0.000	0.000	30.018	
GEO STR	SPORT	3.491	41.537	29.320	3.840	0.000	78.187	
	SUBTOTAL	40.839	204.893	204.196	23.386	0.000	473.312	49%
WASH/OR OCEAN	TROLL	0.000	2.094	30.367	1.396	0.000	33.858	
WASH/OR OCEAN	SPORT	0.000	0.698	0.000	0.000	0.000	0.698	
N PGT SND	NET	2.094	11.519	30.716	17.453	1.745	63.527	
OTHER PGT SND	NET	5.236	27.226	34.905	1.396	0.000	68.763	
WASH COASTAL	NET	0.000	0.000	0.000	0.000	0.000	0.000	
NTH PGT SND	SPORT	0.000	28.971	56.801	33.509	6.283	125.364	
OTHER PGT SND	SPORT	5.934	51.310	22.339	3.141	0.000	82.725	
	SUBTOTAL	13.264	121.819	175.129	56.895	8.028	373.133	39%
TERMINAL (ELWHA)	NET	0.000	1.396	0.000	0.000	0.000	1.396	
TERMINAL (ELWHA)	SPORT	0.000	0.000	0.000	0.000	0.000	0.000	
	SUBTOTAL	0.000	1.396	0.000	0.000	0.000	1.396	0%
	GRAND TOTAL	54.103	384.304	412.378	101.923	8.377	961.285	100%

TO OBTAIN ESTIMATE OF CATCHES IN NUMBERS OF FISH, MULTIPLY VALUES IN THESE COLUMNS BY THE SUSTAINABLE YIELD EXPRESSED IN ADULT EQUIVALENTS (1000'S)

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STAFF REPORT

EXHIBIT

Table 1. AVERAGE DIVERSION EFFICIENCY*

Coho Yearling Smolts
(before Screen adjustments)

test conditions	Intake	Penstock
4/4 (1)	96.9%	100.0%
4/6	93.3%	97.4%
6/6	95.8%	99.5%
6/7.8	94.2%	99.4%
7/7	97.9%	99.3%
7/7.8	98.2%	99.0%
7.8/7.8	96.7%	97.4%
7.7/8.5	98.8%	100.0%
Average	96.5%	99.0%

(1) The first value is penstock velocity, and the second value is by-pass velocity in fps.

Coho Yearling Smolts
(after Screen adjustments)

test conditions	Intake	Penstock
7/7	98.7%	99.3%
7/7.8	98.0%	101.0%
7.8/7.8	98.9%	99.5%
7.7/8.5	100.6%	99.7%
Average	99.1%	99.9%

Steelhead Yearling Smolts
(after Screen adjustments)

test conditions	Intake	Penstock
4/4	98.6%	100.0%
4/6	99.7%	99.3%
6/6	99.7%	99.3%
6/7.8	100.0%	99.7%
7/7	99.3%	100.0%
7/7.8	100.0%	100.0%
7.8/7.8	100.4%	99.6%
7.7/8.5	99.7%	99.7%
Average	99.7%	99.7%

Chinook Fingerling Pre-smolts

	Before Screen Adjusted	After Screen Adjusted
test conditions	Penstock	Penstock
4/4	92.5%	99.1%
6/6	89.5%	
7/7	86.7%	
7.8/7.8	83.6%	98.3%
Average	88.1%	95.7%

* Early in the evaluation higher than expected numbers of fish were not recovered during the experimental runs. The penstock was shutdown and dewatered. Upon inspection it was found that the screen was not sealing tightly. Following adjustments on the closing mechanism high recovery efficiency was restored.

Table 2. AVERAGE DESCALING

	Greater Than 16% Descaled (%)	3% to 16% Descaled (%)
Coho Yearling smolts		
test conditions		
4 fpc (48% gate)	0.0%	4.0%
6 fps (70% gate)	0.3%	2.1%
7 fps (83% gate)	1.7%	7.8%
7.8 fps (100% gate)	4.3%	10.8%
Steelhead Yearling smolts		
test conditions		
4 fpc (48% gate)	0.0%	1.3%
6 fps (70% gate)	0.4%	2.5%
7 fps (83% gate)	0.7%	4.6%
7.8 fps (100% gate)	2.5%	7.1%
Chinook Fingerling Pre-smolts		
test conditions		
4 fpc (48% gate)	0.2%	0.2%
6 fps (70% gate)	0.9%	0.9%
7 fps (83% gate)	3.0%	7.7%
7.8 fps (100% gate)	8.2%	8.4%

EXHIBIT

Table 3. DELAYED MORTALITY, Deaths During Four Day Holding Period

Coho Yearling Smolts

test conditions	Intake	Penstock	Control
4/4 (1)	0.0%	0.0%	0.0%
4/6	0.0%	0.0%	0.0%
6/6	0.0%	0.0%	0.0%
6/7.8	0.0%	0.0%	0.0%
7/7	0.2%	0.2%	0.5%
7/7.8	0.2%	0.4%	0.3%
7.8/7.8	0.4%	0.0%	0.0%
7.7/8.5	0.4%	0.0%	0.0%
Average	0.2%	0.1%	0.1%

(1) The first value is penstock velocity, second value is by-pass velociity.

Steelhead Yearling Smolts

test conditions	Intake	Penstock	Control
4/4	4.9%	5.2%	7.8%
4/6	4.2%	3.1%	2.1%
6/6	3.0%	4.4%	3.1%
6/7.8	4.9%	4.2%	5.7%
7/7	3.9%	5.9%	3.9%
7/7.8	5.2%	7.8%	6.9%
7.8/7.8	2.2%	3.9%	2.2%
7.7/8.5	2.8%	5.6%	3.8%
Average	3.9%	5.0%	4.4%

Chinook Fingerling Pre-smolts

test conditions	Intake	Penstock	Control
4/4	NA	0.2%	5.4%
6/6	NA	0.6%	0.3%
7/7	NA	1.7%	0.4%
7.8/7.8	NA	0.3%	1.9%
Average		0.7%	2.0%

EXHIBIT

EICHER SCREEN EVALUATION
MAY 1991
PRELIMINARY RESULTS

Courtesy of
ELECTRIC POWER RESEARCH INSTITUTE

The Electric Power Research Institute is currently conducting its second year of evaluation studies of the Eicher Screen installed in Penstock Number 1 at the Elwha Project. Testing with coho yearling smolts, steelhead yearling smolts and chinook fingerling pre-smolts was conducted during May, and testing with chinook fingerling smolts will be completed on July 2. Preliminary results from the May tests indicate that over 99% of the coho smolts, 99% of the steelhead smolts and 98% of the chinook fingerling pre-smolts were recovered live at each of the four penstock velocities tested (Table 1). At penstock velocities of 6 fps or less, less than 1% of the fish were descaled (over 16% scale loss on one side)(Table 2). Descaling was more prevalent at the higher velocities, reaching a maximum at 100% gate, when 4.3% of the coho smolts, 2.5% of the steelhead smolts and 8.2% of the chinook pre-smolts were descaled. There appears to be no significant difference between the mortality rate of experimental and control fish during the four days that fish were held following recovery (Table 3).

COHO SALMON

The data for coho yearlings gathered this year is similar to results achieved in last years evaluations. At full gate approximately 4% of the fish had descaling equal to or greater than 16%. Over a four day holding period, however, delayed mortality rates were extremely low and experimental and control fish did not show significant differences.

If delayed mortality is very low and there is not a significant difference between experimental and control fish, then diversion efficiency is the best indicator of passage success. Coho salmon pass the Elwha Project in May and June at which time the flow in the river is above 2000 cfs which permits the Project to operate at full capacity (full gate). Data gathered in 1990 and preliminary data collected in 1991 indicate that coho should be assigned a passage success of 99 percent.

STEELHEAD TROUT

Steelhead yearling smolts are larger than coho smolts and it would be expected that they would be stronger swimmers and more capable of avoiding obstacles. This seems to have been borne out by the evaluation. As noted above, however, for any given set of conditions they consistently had higher delayed mortality rates than coho. Field observations indicate that the

REPORT

higher mortality rates may be due to the difficulty of keeping these larger fish in the small evaluation tanks. Preliminary inspection of the delayed mortality data does not indicate any significant differences between the experimental and control fish.

If descaling rates are low and there is not a significant difference in delayed mortality between experimental and control fish, then diversion efficiency is the best indicator of passage success. Steelhead would pass the Elwha Project in May and June when flows in the river are high and the Project would be operating at full gate. Base on a review of preliminary 1991 data, steelhead should be assigned a passage success rate of 99 percent.

CHINOOK SALMON

Preliminary evaluation of chinook fingerling pre-smolts indicates that they conform to the general patterns that are emerging from the evaluation, namely that smaller (and more weakly swimming) fish do not avoid the screen as well as larger fish and have higher levels of injuries. At lower gate settings (4 and 6 fps) descaling rates were less than 1 percent. At full gate the percent of fish with descaling >16 percent was 8 percent. Low levels of delayed mortality were observed and there did not seem to be a significant difference between the experimental and control fish. Diversion efficiency was 98 or 99 percent depending upon penstock velocity.

Evaluations are now underway on chinook fingerling smolts. These fish are larger than pre-smolts and should be better swimmers, thus it is expected that passage success will be higher for smolts than for pre-smolts.

Based upon the experiments conducted in 1989 (FAO, October 1990), chinook smolts will migrate pass the Elwha Project starting in April with the preponderance of the migration occurring between the end of July and the middle of October. Generally flow in the River will be in excess of Project capacity much of May and June and the Project would be operating at full capacity. In July flows are generally around 1500 cfs or about 3/4 of the Project's capacity. During August, September and October flows are generally below 800 cfs, less than half of Project capacity.

It is reasonable to assume that much of the chinook smolt out-migration will occur when the Project is operating at less than full capacity. The Applicant believes that when all of the data are "in" and the analysis is completed that the average downstream passage success for chinook smolts will be about 99 percent

Lincoln Electric Cooperative, Inc.
P.O. BOX 289 725-1141
DAVENPORT, WASHINGTON 99122-0289

May 6, 1991

Mr. Arthur C. Martin, Regional Director
Federal Energy Regulatory Commission
1120 S.W. Fifth Avenue
Portland, OR 97204

Dear Mr. Martin:

Lincoln Electric Cooperative, Inc. is concerned about the removal of any viable generating facility in our region. Our region is in what some call "Loan/Resource Balance". This means our electrical loads are approximately equal to our total generating resources. Removing two dams on the Elwha River in Washington does not make any sense in the situation of Load/Resource Balance.

LEC-1 If these dams are removed, not only do we need to find resources through conservation or other means for the additional future new loads, but also find resources to replace the removal of existing resources. The costs of removing these two dams plus costs to develop new projects to replace these dams' resources is just plain unrealistic and uneconomically not to mention the dangerous precedent removal would set.

The attached resolution was passed unanimously by our member elected Board of Trustees at our last meeting.

Thank you for your careful consideration of this matter.

Sincerely,

LINCOLN ELECTRIC COOPERATIVE, INC.

Ralph Byre

Ralph Byre
Manager

Enclosure

SERVING RURAL AREAS IN LINCOLN AND ADAMS COUNTIES

LEC-1: Concerns about dam removal are noted.

STAFF REPORT

LINCOLN ELECTRIC COOPERATIVE, INC.
DAVENPORT, WASHINGTON 99122
WASHINGTON 37, LINCOLN

RESOLUTION 91-5

KEEP ELWHA RIVER DAMS

WHEREAS, there is consideration being given to removing the Elwha Dam and the Glines Canyon Dam on the Elwha River in the State of Washington, and

WHEREAS, these dams are harnessing power capabilities that are non-polluting energy sources and are renewable resources for electrical energy production, and

WHEREAS, the use of these facilities will not contribute to concerns over global warming or acid rain, and

WHEREAS, the region presently needs and is looking for electrical energy resources to serve a growing economy, and

WHEREAS, the salmon runs in the reaches of the river above these dams are already interrupted and extinct, and

WHEREAS, the removal of these dams is a very costly endeavor which has questionable merit.

NOW THEREFORE BE IT RESOLVED, that Lincoln Electric Cooperative oppose the removal of these valuable power sources, and

BE IT FURTHER RESOLVED, that we urge our congressmen and others to oppose the removal of these dams.

ADOPTED this 24th day of April 1991.

I.W. Graedel, Secretary

SEAL

Ken Jacobsen, President

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of the Chief Scientist
Washington DC 20230

June 6, 1991

Ms. Lois D. Cashell
Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Secretary Cashell:

Enclosed are comments to the Draft Environmental Impact Statement on the Glines Canyon (FERC No. 588) and Elwa (FERC No. 2683) Hydroelectric Projects, Washington. We hope our comments will assist you. Thank you for giving us an opportunity to review the document.

Sincerely,

David Cottingham

David Cottingham
Director
Ecology and Conservation Office

Enclosure

DRAFT
STAFF REPORT

COMMENTS OF NATIONAL MARINE FISHERIES SERVICE

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
911 NE 11th Avenue - Room 620
PORTLAND OREGON 97232
503/230 5400 FAX 503 230 5435

F/NWR5

Ms. Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, D.C. 20426

Re: Draft Environmental Impact Statement - FERC/EIS-0059D: Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington.

Dear Secretary Cashell:

The National Marine Fisheries Service (NMFS) has reviewed the subject document. NMFS would like to provide the following comments for your consideration.

General Comments

NMF-1 The Draft Environmental Impact Statement (DEIS) is concise and well-written, providing a good summary of the issues involved and decisions that must be made regarding Elwha and Glines Canyon dams. We are particularly pleased to see that the document discusses preferred methods of dam removal; the consequences of various alternatives on restoration of fish, wildlife, and the ecosystem; the contribution of sediments produced in the Elwha basin to marine nearshore areas; alternatives to the mitigation plan advanced by James River II (Applicant); and replacement power for the Daishowa mill. Nevertheless, the DEIS contains a few significant omissions or oversights which should be addressed.

NMF-2 1. No Action Alternative/Continuing Losses: The DEIS mischaracterizes the "no action" alternative in this proceeding. The "no action" alternative would not be continued operation of the two projects without modification, as the DEIS presumes. Under current circumstances and law, the projects have no authorization or entitlement to remain and operate on public water resources without federal licenses. No action by the Federal Energy Regulatory Commission (Commission) would, therefore, amount to no license issuance, and no right of the projects to continue as they have in the past.

RESPONSES TO NATIONAL MARINE FISHERIES SERVICE

NMF-1: Comment noted.

NMF-2: The EIS does not presume or suggest that continued operation of the two projects without modification constitutes the "no-action" alternative.

The staff sees no rationale for a discussion of the continuing, cumulative losses caused by the two projects since their construction. The focus of the EIS, consistent with FERC policy in addressing the licensing of constructed projects, is the improvement of present-day conditions in the light of today's resource objectives. The discussion of historical conditions contained in Section 3.0 is adequate to explain the importance of the anadromous fish restoration objective in the context of past and present conditions.

The EIS does not address "foregone power revenues." Instead, the EIS properly evaluates the incremental cost to the region of replacing any power generation foregone through Commission's action in this proceeding.

COMMENTS OF NATIONAL MARINE FISHERIES SERVICE

NMF-2 cont'd

For the most part, this oversight has not resulted in major deficiencies in the DEIS because many aspects of the "no action" alternative are addressed in discussions of restoration and dam removal. We have identified only two areas where major revisions are necessary. First, by way of background, we recommend a discussion of the continuing, cumulative losses caused by the two projects since their construction, i.e., an estimate of the lost salmon and steelhead production potential cumulated for each year of operation. Second, we recommend that the use of "foregone power revenues" in the DEIS' economic analyses be deleted, since it presumes some degree of entitlement to such revenues.

NMF-3

2. Resource Objectives: We concur in the first and second resource objectives in the DEIS, which relate to fish and wildlife and the ecosystem of Olympic National Park. However, we suggest that the third resource objective be reconsidered and redrafted to more accurately reflect the decision before the Commission: "provision of environmentally sound energy for the Daishowa mill." This revised objective takes into account both the environmental damage accruing from the projects and the availability of alternatives such as energy conservation and power purchase from existing hydroelectric projects.

We also suggest that the relationship between the second resource objective and the issue of jurisdiction over the Glines Canyon project be discussed in the DEIS. Briefly, the Commission may well have no authority to compromise the protection of Olympic National Park resources in its licensing decisions.

NMF-4

3. Views of the Joint Fish and Wildlife Agencies: The DEIS fails to identify the views of the Joint Fish and Wildlife Agencies (JFWA; consisting of NMFS, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, National Park Service, Washington Department of Wildlife, Lower Elwha Klallam Tribe, and the Point No Point Treaty Council) on additional information needs, the adequacy and effectiveness of particular mitigation measures, and the biological desirability of dam removal. For example, the JFWA have repeatedly requested that information be developed on conventional screening for both powerhouses, on acceptable spill levels, and on a specific restoration plan prior to licensing. While the DEIS recognizes that further information might be necessary, particularly in its recommendations for additional mitigation, there is no indication that such information would be developed prior to licensing. Similarly, the DEIS fails to note some of the problems and limitations associated with the mitigation proposed by the Applicant, such as trap and haul, spill of only 100 cfs (as opposed to 450 cfs and screening) at Glines Canyon Dam, lack of mitigation to restore the estuary, and lack of riverine habitat restoration (such as gravel and large woody debris supplementation).

RESPONSES TO NATIONAL MARINE FISHERIES SERVICE

NMF-3 The third resource objective is much broader than providing energy to the mill. The objective relates to the use of an existing hydroelectric resource within a regional interconnected system.

Section 1.2.1.2 describes the uncertainty regarding Commission jurisdiction to relicense Glines Canyon.

NMF-4: The EIS has been augmented with the addition of Section 5.6.3 and Table 5-10, which itemize fish and wildlife recommendations. Further, Sections 4.1.3.3, 4.1.4.1, and 4.1.4.2 have been modified to further evaluate agency recommendations. With regard to recommendations for additional studies, it is the Commission's responsibility to determine what information is needed to conduct its evaluation and to make an informed decision (reference U.S. Court of Appeals, U.S. Department of the Interior vs. FERC, January 10, 1992).

DRAFT STAFF REPORT

COMMENTS OF NATIONAL MARINE FISHERIES SERVICE

NMF-5

4. Balancing the Public Interest: Under the Federal Power Act (FPA), the Commission must balance competing uses of water resources in making a determination of the public interest. We are pleased that the DEIS has taken into account certain non-development purposes in its analysis. However, we are concerned that the findings of the DEIS (Section 5) do not reflect the full range of the Commission's public interest review and balancing. For example, the Commission must take into account the unmitigated, longstanding, past damage to natural resources caused by the projects. This includes devastating past losses suffered by commercial, recreational, and tribal fisheries and by the residents of the region. How would it be equitable for the Commission to allow continued loss of most stocks of fish, as would occur with the dam retention alternatives?

NMF-6

The Commission must also take into account the substantial uncertainty associated with any of the dam retention alternatives. Even with the changes recommended by Commission staff, the DEIS acknowledges that restoration of chinook and coho salmon and steelhead trout with dam retention is questionable (the DEIS discusses further evaluations of spill at Glines, conventional technology if Eicher screens do not work, evaluations of reservoir mortalities, and continued hatchery funding for each of the three species "in the event restoration fails"). How many years does the Commission consider necessary to determine if dam passage is adequate for restoration? If passage does not result in restoration except for perhaps steelhead, does the Commission consider this adequate? If only steelhead are ultimately restored with the dams in place, will restoration of the remaining stocks have to wait until the next licensing period? If dam passage does not result in restoration, how is that condition different from status quo? Once the projects are licensed, how can restoration ultimately be achieved "in the event restoration fails?"

NMF-7

5. Cost Analysis: The cost analysis for the dam retention alternative only considers the Applicant's proposal. The cost analysis should consider all measures identified under the dam retention alternative since both Commission staff and the JFWA have recommended additional measures. For example, Commission staff recommended changes would result in an additional cost of $1.3 million for the Elwha Dam fish ladder (DEIS, page 4-34) and $4.3 million to operate Lake Mills run-of-the-river (DEIS, page 4-35). The dam retention alternative and economic analysis must consider agency measures that would be recommended under section 10(j) and prescribed under section 18 of the FPA. Additionally, the DEIS should include a discussion of the new recycling plant at the Daishowa mill and its effect on power costs at the mill.

RESPONSES TO NATIONAL MARINE FISHERIES SERVICE

NMF-5: Refer to response NMF-2. The Commission uses present-day conditions as a baseline from which to compare beneficial and adverse effects of proposed actions.

NMF-6: There exists substantial uncertainty with the staff's predictions for restoration, and that uncertainty does not only apply to the dam retention alternatives (refer to Section 5.6.1, Item 6). The staff believes that 10 to 15 years from the completion of facility modifications should be enough time to determine the outcome of a dam retention decision. The staff believes that the applicant's proposal with supplemental measures (with a good chance for restoring fall chinook, winter steelhead, and summer steelhead) represents an appropriate balance among resource objectives. If only steelhead are ultimately restored, further actions could be considered by the Commission at any time under its standard licensing article requiring the licensee to modify project structures or operation as may be ordered by the Commission. Such an order can be made upon the Commission's own motion or upon the recommendation of the Secretary of the Interior or appropriate state fish and wildlife agencies.

NMF-7: The cost analysis has been expanded to address the cost of supplemental measures. Reference EIS Section 2.2.5. Section 2.7.3 has been modified to address the new recycling plant.

NMF-8 In terms of alternatives, NMFS believes that only dam removal will result in full restoration of the anadromous fish resources and ecosystem processes of the Elwha River basin. Also, it is apparent that once mitigation is supplied under the dam retention alternative, the power produced by the dams no longer provides an economic benefit to the Daishowa mill, especially with other, less expensive power options available. Therefore, NMFS believes that the removal of both dams should be the preferred option in the Final Environmental Impact Statement (FEIS). We do not consider the removal of only one dam as an acceptable alternative since it would not result in full fish, wildlife, and ecosystem restoration while substantially increasing the cost of power to the mill.

Specific Comments

NMF-9 Page xxxiv: The Executive Summary states that the Applicant's proposal "...would have excellent restoration potential..." for winter steelhead trout. However, Table 4-4 (page 4-14) and elsewhere in the DEIS notes the prospect only as "good." The Executive Summary should be corrected.

NMF-10 Page xxxvi: The Executive Summary also states that "[a]nadromous fish restoration measures would not commence during the five-year construction period..." of dam removal. However, steelhead rear for two years in freshwater before migrating to sea while coho rear for one year. Plants of steelhead in the unaffected upper Elwha could commence two years prior to the end of the construction period with plants of coho one year before. It is not necessary to wait until the end of the estimated five year construction period to initiate fish restoration measures.

NMF-11 Page 2-12, Operation: The Applicant's proposed 10-year period to implement a fish restoration program is insufficient. If passage success and outplanting programs are not initially satisfactory in all respects, achievement of fish restoration is jeopardized from the beginning. Even with adequately functioning passage facilities, restoration with the dams in place would likely involve a continuing program of outplanting over the life of the license. However, continuous outplanting should not be construed as actual restoration.

NMF-12 Page 2-13, Operation: A minimum spill of 100 cfs at Glines may adversely affect both juvenile and adult migrants. Evaluation of the 1988 emigration at Glines clearly indicates a significant, positive correlation between higher spill volume and higher passage of coho and steelhead smolts (Wunderlich et al. 1989). Fish attraction to the spillway may be impaired with a 100 cfs release. Also, juvenile exit selection studies at Glines

NMF-8: Comments noted.

NMF-9: The text has been changed in the Executive Summary.

NMF-10: The text has been changed in the Executive Summary.

NMF-11: Comment noted.

NMF-12: This section presents the applicant's proposal and does not assess its merits. Spill quantity and gate opening are addressed in Appendix B and Section 4.1.3.3.

DRAFT STAFF REPORT

NMF-12 cont'd

(Wunderlich and Dilley 1988, Wunderlich et al. 1989, Dilley and Wunderlich 1990) were largely based on higher minimum spills throughout the study periods (130 to 175 cfs). Projections of fish survival with 100 cfs spill based on these studies (see DEIS Appendix B) will result in overestimates.

The proposed 100 cfs spill at Glines equates to raising the spillgate less than three inches, resulting in an additional hazard for juvenile migrants not addressed in the DEIS. During a 100 cfs spill, water passing under the spillgates at Glines moves at about 35-40 feet-per-second (FPS) under 20 feet of head (normal reservoir elevation). Such high velocities coupled with very limited physical clearance (less than three inches) may injure or kill migrants. All of the survival tests conducted at the Glines spillway were accomplished by release of fish <u>on the downstream side of the spillgate</u>; effective release of the test fish upstream of the spillgate was not physically possible because of the limited spillgate opening. Therefore, spill survival values do not reflect additional possible mortalities and injuries from passage through such a confined opening. For these reasons, safe and effective passage of steelhead kelts and adult Dolly Varden and cutthroat trout is highly unlikely with only 100 cfs of spill.

The reservoir drawdown of 10 feet proposed by the Applicant may adversely affect juvenile and adult passage at and below Glines, and should be noted in the DEIS. Drawdown and refill, as proposed by the Applicant, may capture freshets that typically induce both downstream and upstream migrant passage. Nearly all juvenile exit selection data described in the DEIS for Glines was largely measured under run-of-the-river conditions. Deviation from run-of-the-river could reduce effectiveness of spill for passing migrants at Glines, and render previous measures of juvenile exit selection inappropriate for describing juvenile passage at Glines. The peak passage period for both coho and steelhead smolts occurs prior to Memorial Day, so 10-feet drawdowns during this period make these species especially vulnerable to the Applicant's proposal. Reducing freshets may also cause delay of adult migrants below Glines Dam.

NMF-13

Page 2-22, <u>Estimated Costs</u>: The costs of fish production facilities was included in the $64 million estimate of dam removal. The cost of these facilities was apparently based on the Applicant's estimate of $3,070,000 (see Table V-1 of the Applicant's June 5, 1990 Fish Passage and Restoration Plan). However, a cost breakdown of this estimate, and the $240,000 annual O&M estimate, has not been provided. These estimates cannot be fully evaluated without detailed information.

NMF-13: Appendix A, Part 7 has been expanded to include greater cost detail for fish restoration activities.

COMMENTS OF NATIONAL MARINE FISHERIES SERVICE

NMF-14 Page 2-29, Use of Project Power: Although the DEIS mentions the proposed expansion of the Daishowa mill, the Recycled Paper Plant Project was not discussed. This project could result in energy savings of 12-15 megawatts (see February 5, 1991, filing by the Conservation Intervenors). These cost savings should be included in any discussions of mill economics.

NMF-15 Page 3-1, General Description of the Elwha River: Operation of the projects is referred to throughout the DEIS as approximating run-of-river conditions. This is based on the Applicant's assurance that the Elwha Project will continue to be operated as run-of-river while Lake Mills will be fluctuated up to 10 feet. However, the Applicant has never articulated how frequently these drawdowns will occur, contrary to repeated requests by the JFWA. It is inappropriate to refer to operation of the Glines project as near or approximating run-of-river if the frequency of drawdowns is not clarified. As well, it is not accurate to refer to operation of the Elwha Project as run-of-river as long as Lake Mills is fluctuated for power production.

NMF-16 Page 3-20, Elwha River Mouth and Coastal Area: We appreciate the reestimation of the potential contribution of Elwha River sediments to Ediz Hook. This further illustrates the need to allow natural sediment transport in the Elwha to occur.

NMF-17 Page 3-21, Water Use: Minor corrections are necessary to clarify water usage. The State of Washington only operates a rearing channel on the Elwha River whereas the DEIS refers to the channel and "...state fish rearing ponds." This should be clarified. Also, there is only one tribal hatchery on the river.

NMF-18 Page 3-28, Estimated Historical Fish Numbers: Sturgeon should also be included in the list of fish species that inhabited the Elwha.

NMF-19 Regarding sockeye salmon, two tribal elders failing to mention sockeye does not constitute lack of occurrence. Also, sockeye need a lake or lake-like environment in which to rear. Since a natural barrier on the Lyre River precludes upstream passage of anadromous fish to Lake Crescent (the only other Strait of Juan de Fuca stream draining a lake), it is not surprising there are no other sockeye runs in the Strait. This should not be used as an argument against the historical presence of sockeye in Lake Sutherland.

NMF-20 The upstream limit of pink and chum salmon adult migration has not been documented. The JFWA have used river mile (RM) 16 to estimate potential production of pink and chum salmon, but these species may have migrated farther upstream.

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NMF-14: Section 2.7.3 has been modified to incorporate effects of the new Recycled Paper Project.

NMF-15: Sections 4.1.2 and 4.1.2.2 have been revised to state that the Glines Canyon dam would not operate as run-of-river under the applicant's proposal. Proposed water fluctuations of up to 10 feet in Lake Mills for power generation, and for augmentation of low flows for fish, would preclude the Glines Canyon Project from being considered as having run-of-river characteristics. Because water elevations would not fluctuate in Lake Aldwell, the Elwha Project would continue to operate as run-of-river. However, the staff acknowledges that flows in the middle and lower reaches of the river would be influenced by flow-release patterns from the Glines Canyon Project.

NMF-16: Comment noted.

NMF-17: See text changes to Section 3.3.2.

NMF-18: See text addition to Section 3.4.1.1.

NMF-19: See responses DOI-53 and DOI-154. The text has been changed in Section 3.4.1.1.

NMF-20: Text has been changed in Section 3.4.1.1.

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NMF-21 Page 3-31, Chinook Salmon: The conclusion that it is unlikely any existing spring chinook in the Elwha maintained genetic integrity is only speculation. "Co-temporal spawning with other chinook" has not been documented. Also, the genetic impacts to native spring chinook of the 1973 and 1977 releases of Dungeness and Soleduck stocks were never evaluated. It should be noted that only one recovery of a fish with tag code 150215 was ever recorded, indicating that the release was a failure. It is extremely unlikely that a failed hatchery release had any significant impact on the genotype of the native run. The question of the existence and genetic integrity of Elwha spring chinook cannot be determined without a specific study, as requested by the JFWA.

NMF-22 The DEIS frequently refers to in-river harvest of chinook. However, a tribal directed commercial fishery on chinook has not occurred in the Elwha in well over ten years. It is important to differentiate between catches during directed fisheries (that have only occurred on coho and steelhead), incidental catches (fish taken during fisheries directed at another species), and test fisheries (for the purpose of acquiring technical or management information; see page 10 of June 12, 1990 letter from JFWA to Richard Fleming). Chinook harvest is still restricted, not "formerly restricted" as characterized in the DEIS.

NMF-23 Page 3-33, Chinook salmon: We do not agree with the Applicant that Lake Mills is not a source of Dermocystidium. There is not enough evidence to arrive at a conclusion (see pages 22-24 of June 12, 1990 letter from JFWA to Richard Fleming).

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NMF-21: See response DOI-57.

The statement made at the start was "may not be the original Elwha stock." The staff believes the available information does not change this statement. While co-temporal spawning has not been documented, personal communication with Bill Graeber of WDF suggested that redds were not observed outside of the normal range of occurrence for the existing summer/fall stock during spawning surveys conducted in the lower river. This suggests that non-cotemporal spawning does not appear to be occurring, or if it does, occurs at a different time. The time separation is so small in this confined region of river that mingling of the two stocks (summer/fall and spring) is highly likely when considering the long period it has had to occur since the Elwha dam was constructed.

The staff believes the information presented concerning the effects of the earlier spring chinook releases does not substantially alter the statement that these plants could also have affected the native stock genetics. Of the 1973 release, only 20,000 of 170,000 were tagged. This release made at an unusual time for spring chinook outmigration (January and February) could have reduced survival. However, even with this poor release timing at least one measured return occurred. Because no effort is actively made to recover these stocks, other than brood stock collection for summer/fall chinook, which might have been too late to recover an earlier spawning stock, some fish could have successfully spawned in the river before this collection. As has been found in the past with summer/fall chinook, the majority of returning fish released from a rearing channel do not enter the channel. Even a few fish could have significant genetic effects on a greatly depressed wild stock.

The second spring chinook release in 1977 could have had an even more dramatic effect. A total of 500,000 fish were released at the proper time for spring chinook outmigration (April), and none of these fish were tagged; therefore, the record of their total survival is not known. Because these stocks return over several years, they could have continued to mingle with any small numbers of native spring chinook that might have been present.

Based on these factors and those presented in the text, the staff believes that the statements made in the EIS are appropriate, so they will remain.

NMF-22: The text has been changed in Section 3.4.3.1.

NMF-23: This statement is based on the studies and conclusions of a fish pathologist. The reservoir being the source of the disease cannot be totally ruled out, but the best information available does not support the reservoir as being the major source. This disease also has been found in highly lethal levels in an Oregon coastal stream without having a reservoir present, so the need for a reservoir to produce this disease is not as essential as often stated in the past.

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NMF-24 The conclusion that "[c]hinook salmon production in the lower Elwha River is probably not limited by availability of spawning gravels" is speculative. Snorkeling observations by JFWA biologists indicates that many of the riffles in the river below the rearing channel have good spawning gravel; this is where most of the spawning takes place in this reach. On the other hand, the tail-outs of pools are lacking in suitable gravel which has been evidenced by incomplete redd construction in these areas. Also, the river below Elwha Dam down to the rearing channel has become armored. Although redd surveys indicate high redd densities in this reach (except from RM 4.4-4.9), egg survival in this potentially marginal spawning habitat, as well as the rest of the river, is unknown.

NMF-25 The 15-redds-per-mile density is out-of-date since it reflects low run sizes prior to rebuilding under the Pacific Salmon Treaty.

NMF-26 Potential chinook salmon habitat also includes the following streams: Boulder, Buckinghorse, Goldie, Hayes, Lillian, Long, Lost, and WRIA Nos. 542, 544, 554, 633, and 635, for an additional 10.5 miles.

NMF-27 Page 3-39, <u>Pink Salmon</u>: Considering approximately 180,000 cubic yards of sediment is annually trapped in Lake Mills (DEIS, page 3-12) and prevented from moving downstream, we do not understand how "...the river's current spawning potential..." could possibly be "...similar to what it had been between 1959 and 1967...," a period of over 25 years. Upon what was this observation based? Also, see comments above for Page 3-28.

NMF-28 Page 3-39, <u>Chum Salmon</u>: "The lack of success of the chum planting program..." may simply have been the result of improper stock selection for the program. Concerning the upstream migration limit for chum salmon, see comments above for Page 3-28.

NMF-29 Page 3-105, <u>Fisheries</u>: Concerning in-river harvests, see comments above for Page 3-31.

NMF-30 The statement that "[t]he Pacific Fisheries Management Council's ocean management is not directed toward Strait/Sound stocks" is misleading. The State of Washington and Indian Tribes co-manage Strait/Sound stocks in Washington State waters. However, the Pacific Fisheries Management Council (PFMC) considers Strait/Sound stock strengths when setting ocean harvests. For example, the Hood Canal stock of coho salmon is a weak stock this year so will limit ocean harvest of Strait/Sound origin fish.

NMF-31 Page 4-4, <u>Water Quantity</u>: See comments above for Page 3-1.

NMF-32 Page 4-5, <u>Water Quantity</u>: Adult salmonids, particularly coho salmon, generally move upstream during freshet conditions (Brannon 1981). Smolt emigrations are also associated with freshets. The Applicant's flow augmentation and 10 feet drawdown proposals would likely dampen the positive effects of freshets and adversely impact smolt and adult coho migrations.

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NMF-24: See text changes to Section 3.4.3.1 and response DOI-57.

NMF-25: See text changes to Section 3.4.3.1 and response DOI-57.

NMF-26: The text has been changed in Section 3.4.3.1. The accessible stream miles include all streams without blockage, some of which would not be suitable for spawning.

NMF-27: See response DOI-65. By 1959, the lower river had over 40 years of active scour without additional sediment input from upstream. Considering that the stream could actively displace many thousand cubic yards of sediment per year before the supply is cut off, having over 40 years to reduce the channel storage of the more easily displaced gravel and fines is a reasonable conclusion. The observations of Ray Johnson (letter, former Fish Biologist, WDF, October 28, 1988) confirm this conclusion.

The South Fork Toutle River, which received 50 millions of cubic yards of sediment from the eruption of Mount Saint Helens (Lucas 1985), is an example of how rapidly material can be removed from a system if the supply is eliminated. Within 4 years, the main stem was clear enough of additional sediment to be near "ideal" for steelhead spawning (Lucas 1985). This example illustrates that 40 years is a long time for the active sediment movement process to occur without most major changes in the system to have occurred. Dramatic sediment changes after this 40-year period would not be expected to occur in more recent times.

NMF-28: See text changes in Section 3.4.3.4.

NMF-29: See text changes in Section 3.9.3.1.

NMF-30: Comment noted.

NMF-31: Refer to response NMF-15.

NMF-32: See response NMF-95. The staff believes the overall effects would be minor for migration but has recommended that the drawdown not occur, except if requested by the agencies to augment low flow during the late summer as has occurred in the recent past (see Section 4.1.3.3).

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NMF-33 Page 4-7, Middle Reach: The DEIS discusses temperature effects on water quality only in relation to state criteria of 16° C. Elevated water temperatures below 16° C can also have adverse impacts. Salmon and trout have adapted over hundreds of generations in particular streams to spawn and emerge at times best for their survival. Increases in water temperatures accelerates developmental processes resulting in earlier emergence timing. Over a 10 year period, changes in mean stream temperatures between the time of peak spawning and fry emergence accounted for 82% and 77% of the variance in the median emigration date of chum and coho salmon fry from Carnation Creek, British Columbia (Holtby et al. 1989). Impacts on macroinvertebrates may be more severe. The Applicant's projects adversely alter temperatures in the Elwha River. The DEIS should also address stream temperature increases resulting from spills greater than 100 cfs at Glines since higher spills may be needed to safely and effectively pass migrants.

NMF-34 Page 4-17, Chinook Salmon: A "poor" prospect for chinook restoration with the dams in place is more appropriate than a rating of "fair." Under the Commission staff's rating system, a fair rating was just minimally achieved because of passage losses of 46%. Greater than 50% passage losses, in the staff's rating system, would have yielded an overall poor rating. We believe that at least an additional 5% passage mortality loss is highly probable in the fall chinook passage model in Appendix B. See below.

NMF-35 Page 4-21, Dermocystidium: We disagree with the statement that few chinook subyearlings would be present in the lower river in late summer, so Dermocystidium would not be a potential problem. Work by Dilley and Wunderlich (1990) clearly showed that late summer was the peak of outmigration at Glines, so relatively high densities of juvenile chinook are likely in the lower river at that time. Also, see comments above for Page 3-33.

NMF-36 Page 4-21, Stock Selection and Availability: See comments above for Page 3-31.

NMF-37 Page 4-24, Passage: Downstream passage must be provided for steelhead kelts since repeat spawners are an important genetic component of wild steelhead runs. The Applicant's spill proposal would not allow kelts to safely exit Lake Mills. As well, forcing all downstream migrants past the Eicher screens at Elwha Dam will likely result in injuries to kelts.

NMF-38 Page 4-30, Habitat: We disagree that habitat for chum salmon under the Applicant's proposal would be "marginally favorable." It is inconsistent with the determination that the middle and lower river is "unsuitable" chum habitat (DEIS pages 3-39 to 3-41) and with the "unfavorable" rating assigned to pink habitat.

NMF-39 Page 4-30, Passage: Sockeye passage survival should be lower than for coho or steelhead because sockeye salmon smolts are more susceptible to descaling and mortality from passage through hydroelectric project bypass systems than are smolts of other anadromous salmonids (Chapman et al. 1990). Studies at Bonneville Dam on the Columbia River indicated that descaling and mortality rates for sockeye were very high (means of 24% and 20%, respectively) while rates for other species were well under 10% in all instances and usually less than 5% (Gessel et al. 1988). The Columbia River Fish Transportation Oversight Team has also

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NMF-33: Changes in temperature from proposals are discussed in Section 4.1.2.2 and additional flow is discussed in Section 4.1.2.3. Effects to fish are discussed in Section 4.1.3.2, and effects with additional spill are discussed in Section 4.1.3.3.

The current summer/fall chinook and wild winter steelhead are producing viable offspring under the current temperature regime (see Sections 3.4.3.1 and 3.4.3.6), indicating that this regime is sufficient for at least these stocks. This regime would not change markedly with either the applicant's or staff proposed spill regime. An example of a very viable chinook stock under greatly modified temperature regime is the North Fork Lewis River stock of fall chinook. This stock primarily spawns below a major dam and currently is a very abundant stock, equaling about 85 percent of the total lower Columbia River fall chinook. The fact that temperature affects the incubation rate of eggs does not indicate that the change in temperature is adverse, only that it differs from natural conditions.

NMF-34: Improved Eicher screen survival increases overall juvenile passage survival. The staff does not believe an additional mortality estimate is justified (see Appendix B).

NMF-35: The text has been changed in Section 4.1.2.2.

NMF-36: Refer to response NMF-21.

NMF-37: The text has been changed in Section 4.1.2.2 and Appendix B. However, the Eicher screen passage is not believed to be a problem. The passage facilities were designed to protect the smaller, more sensitive life stages with relatively low velocity and unabrasive surfaces. The openings in the proposed passage facilities are all larger than 1 foot, so adult kelt should have no trouble passing the Eicher screen system.

NMF-38: The text has been changed in Section 4.1.2.2.

NMF-39: The text has been changed in Section 4.1.2.2.

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NMF-40 Page 4-31, Habitat: The conclusion that sockeye salmon habitat is "unfavorable" appears to be based on a lack of data rather than on factual information. It is premature to judge the quantity and quality of sockeye habitat without further field investigations.

NMF-41 Page 4-34, Stream Ecology: See comments above for Page 3-1.

NMF-42 Page 4-34, Elwha Fish Ladder Design: See General Comments above.

NMF-43 Page 4-35, Contingency Plan for Elwha Dam Downstream Passage: If the Elwha Project is licensed, conventional screens could be required. Therefore, the increased costs of conventional screens ($9.3 versus $3.7 million capital cost) must be considered when comparing the costs of alternatives. Also, see General Comments above.

NMF-44 Page 4-35, Glines Canyon Project Operating Mode: We agree with Commission staff's recommendation that Glines be operated in a "true run-of-the-river" mode. The added "cost" of this provision ($4.3 million) must be considered when comparing the costs of alternatives. Also, see General Comments above.

NMF-45 Page 4-36, Fish Passage Monitoring Programs: During interim negotiations, the JFWA outlined a Glines passage study as proposed now by Commission staff. Unfortunately, the Applicant refused. However, the timing of the study currently raises concerns. Does the Commission propose that the study be conducted pre- or post-licensing? If post-licensing, how soon after license issuance would the study occur? Irregardless, until further studies document any improvement in passage survival, 450 cfs must be considered the flow necessary to safely pass fish at Glines. Also, see General Comments above.

NMF-46 The timing of the proposed reservoir mortality studies also raises concerns. If the studies occur after a decision regarding licensing has been made, it is not clear how results of the studies could be used. For example, if the decision is made to remove the projects, the reservoir mortality studies are not necessary. If the decision is made to license the projects, it is not clear what could be done to remedy adverse reservoir mortalities with the dams in place, especially considering Commission staff has already recommended run-of-the-river operations.

NMF-47 Page 4-36, McDonald Stream Gage Funding: We agree with the Commission staff's recommendation.

NMF-48 Page 4-36, Anadromous Fish Restoration Plan: Commission staff recommend that the fish restoration program be continued for an indefinite timeframe beyond the Applicant's proposed 10 year period. However, the costs of the dam retention alternative only includes the Applicant's estimate of $3,070,000 for a ten year period. See General Comments above.

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NMF-40: See responses DOI-53 and DOI-154. The staff believes the overall rating is appropriate but admits that uncertainty exists.

NMF-41: Refer to response NMF-15.

NMF-42: See Section 4.1.3.3 for staff recommended alternatives.

NMF-43: While the staff has identified the potential cost increment for conventional screens, their use is not deemed sufficiently likely to include their cost in the alternative.

NMF-44: The added cost has been included in the applicant's proposal with supplemental measures.

NMF-45: Studies would be conducted post-licensing. The timing of the studies would be defined after licensing is determined.

The staff believes that current data are sufficient to warrant flows less than 450 cfs (see Section 4.1.3.3).

NMF-46: The staff believes that current data are sufficient to indicate that measures proposed would adequately protect fish resources. However, the test results would help define if other operation modes or project operations might ultimately be more appropriate after further test results are developed. The test results could indicate that lesser measures would be just as suitable for fish protection. The test results would help refine the operation of the project, refine more subtle effects of the projects on resources, and help balance the impacts to the fisheries resources and power. See response NMF-45.

NMF-47: Comment noted.

NMF-48: Detailed estimates for fish restoration activities can be found in an expanded Appendix A, Part 7.

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NMF-49 Page 4-37, Glines Canyon Fish Screens: It is important to note that the mortality rate for chinook salmon passing through the Glines turbine is about 60%. Since about 10% of all chinook passing downstream do so through the turbine, 6% of all chinook migrants that pass the Glines turbine are killed. This is not an insignificant amount, especially when coupled with reservoir and spill mortalities. We disagree with the conclusion in the DEIS that screens are not warranted at Glines Dam because of the potential high cost. Fish and wildlife mitigation is a cost of doing business on the nation's waterways.

Scoping Document 2 stated that the potential for installing Eicher screens at Glines Dam would be evaluated and noted (page 15) that the "...system is not more complicated than the system contemplated by the applicant for installation at Elwha...." Since staff has proposed Eicher screens for the Elwha Project, the DEIS should discuss the provision of Eicher screens at Glines or otherwise document what data Commission staff used to determine that Eicher screens at Glines are not feasible.

NMF-50 Page 4-51, Salmon Carcass Study: If the dams remain, we agree that the Applicant should fund such a study. However, even if the study is undertaken, it may simply document the probable limited ecosystem response to the Applicant's proposal. Does the Commission intend that the results of the study be used to modify the Applicant's mitigation after license issuance? If so, how? Also, the costs of such a study, and all other proposed studies, should be included in the costs of the dam retention alternative.

NMF-51 Page 4-55, Land Use: The statement that "[t]he applicant's dam retention alternative would have minor adverse effects on land use in the project area" is incorrect. The continued inundation of Olympic National Park lands and important stream habitat are significant and continuing adverse effects.

NMF-52 Page 4-56, Consistency with Comprehensive and Other Resource Plans: We disagree with the conclusion that the Applicant's proposal is consistent with the PFMC Fishery Management Plan. One of the harvest management goals listed in the 1984 Final Framework Amendment is (PFMC 1984, page 3-7):

"Escapements of viable natural spawning stocks of salmon defined in Section 3.5 shall be sufficient to maintain or restore the production of such stocks at optimal levels." Emphasis added.

The noted Section 3.5 includes Puget Sound chinook, coho salmon, and pink salmon.

The PFMC identified the adverse impacts of hydroelectric projects as limiting the attainment of optimal levels (PFMC, page 4-3):

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NMF-49: See Section 4.1.3.3 and response DOI-159.

NMF-50: Section 4.1.4.2 has been modified to describe how the results of a salmon carc[illegible] study would be used and the associated costs of the study.

NMF-51: In evaluating potential changes to existing projects, the Commission adopts a forward-looking approach, using present conditions as a baseline and concentrat[illegible] on current resource needs and opportunities for project improvement.

NMF-52: The staff indicates that the applicant's proposal is generally consistent with the PFMC Fishery Management Plan. As such, some aspects of the plan are not a[illegible] consistent as others. In assessing consistency, degrees of consistency are assign[illegible] to a project modification or proposal that works toward a goal.

NMF-52 cont'd

"Construction of hydroelectric projects has flooded or blocked access to many areas of productive habitat. Operation of hydroelectric projects has resulted in reduced flows during migration, flow fluctuations in salmon spawning areas, increased turbidity and sedimentation of gravel, and temperature modifications. These major physical changes have completely eliminated many areas from salmon production and have seriously reduced salmon production potential in other areas."

The Applicant's proposal will not result in the restoration of pink salmon or optimal production levels of chinook and coho salmon, assuming chinook and coho can be restored with the dams in place. Chum and sockeye salmon will likewise remain unrestored. We note that the PFMC recommended that removal of both dams be the preferred alternative in the FEIS (see April 22, 1991 letter from the PFMC to the Commission).

NMF-53 Page 4-65, Chinook Salmon: There is no such thing as a "personal use test fishery." See comments above for Page 3-31.

NMF-54 Commission staff have commented that the ultimate success of the Eicher screens is unknown and must be further evaluated, actual fish losses in the reservoirs are unknown and should be evaluated, and spill at Glines Dam for passing fish must be further evaluated. Commission staff have further concluded that some fall-back measures, such as conventional screens in place of Eicher screens, must be considered in case dam passage measures are unsuccessful. We concur. However, we do not agree that further partial funding of the WDF rearing channel is an acceptable mitigation measure "...in the event restoration measures are not met." If full restoration cannot be achieved with the dams in place, the dams should be removed.

NMF-55 Page 4-67, Coho Salmon: We do not agree with the concept that hatchery production is acceptable mitigation "...in the event restoration of a wild run is unsuccessful." If full restoration cannot be achieved with the dams in place, they should be removed.

NMF-56 Also, "[t]he availability of Bureau of Indian Affairs (BIA) funds to continue support of the existing coho tribal hatchery..." is irrelevant to the proceeding at hand. The tribal hatchery was built with federal funds to attempt to restore tribal fisheries lost because of the construction and operation of the Elwha and Glines Canyon dams. The federal government should not be expected to continue funding hatchery operations that were necessitated by the Applicant's projects.

NMF-57 Page 4-68, Steelhead: See comments above for Page 4-67.

NMF-53: See text changes in Section 4.1.8.2.

NMF-54: Comment noted.

NMF-55: Comment noted.

NMF-56: The comment concerns whether coho would be available for harvest and is valid in the Socioeconomics section.

NMF-57: This statement is pertinent in the Socioeconomics section. Fish can be harvested whether they are supplied by natural reproduction, the applicant's facilities, or other facilities.

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NMF-58 Page 4-70, Staff Recommended Measures: These costs should be included in the economic analysis of the dam retention alternative.

NMF-59 Page 4-72, Long-term Effects: It is not clear how the partial restoration proposed by the Applicant is consistent with the Tribe's treaty rights, especially since the Applicant's proposal may not result in restoration at all (see General Comments above). The process for arriving at this conclusion should be provided.

NMF-60 Page 4-84, Coastal Zone and Ediz Hook: The economic benefits resulting from the renewed sediment contribution to Ediz Hook should be included in the economic analysis for the dam removal alternative.

NMF-61 Page 4-93, Passage Effects: See comments for Page xxxvi above. Page 4-96, Channel Characteristics and Stability: We do not agree with the conclusion that habitat for sockeye salmon is unfavorable (see comments for Page 4-31 above). We believe that sockeye restoration potential with the dams removed should be rated as FAIR, not POOR.

NMF-62 Page 4-97, Table 4-16: Only chinook and steelhead are included in the table whereas coho is listed in the heading. Also, the subtotals are equal yet the totals are not.

NMF-63 Page 4-100, Habitat: We agree with staff conclusions regarding the potential increase in size of the Elwha estuary and the potential reductions in occurrence of incidences of Dermocystidium. However, we would like to note that although the Queets River estuary may have been considered "limited", salmon production in the river is substantial, and improving.

NMF-64 Page 4-100, Coho Salmon: We believe that the existing coho salmon run in the Elwha River will respond positively to restoration efforts if the dams are removed. Successful introductions of coho elsewhere (e.g., South Fork Skykomish and Deschutes rivers) reinforce this position.

NMF-65 Page 4-101, Habitat: Allowing the natural supply of gravel to reach the lower river will not only provide spawning substrate, it will also result in active sidechannel formation, key coho rearing habitat. Natural inputs of large woody debris will further assist sidechannel formation and likewise improve rearing habitat in the lower river.

NMF-66 Page 4-103, Stock Selection and Availability: For clarification, the agencies and Tribe plan to restore pink salmon to the Elwha River once the dams are removed. Although the details of

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NMF-58: Refer to response NMF-7.

NMF-59: See response DOI-226.

NMF-60: The limited changes to beach replenishment activities under the dam removal alternative are described in Section 4.2.8.2. Because any cost saving would occur gradually and would not begin for 10 to 20 years, the economic effect would be negligibl

NMF-61: The plan has been modified. See Section 4.2.3.1 and Appendix A, Part 3.3. Also see responses DOI-53, DOI-154, DOI-179, CI-89, CI-90, and CI-91.

NMF-62: See changes to Table 4-21 in the main text.

NMF-63: See text changes in Section 4.2.3.2 and response DOI-196.

NMF-64: Comment noted.

NMF-65: See text changes in Section 4.2.3.2.

NMF-66: The agencies have not presented a plan about how or when this or other stocks would be restored. The Dungeness stock might be suitable, but it is not a native stock; therefore, its use is more questionable and it gets a marginal rating. See responses DOI-197 and DOI-201.

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NMF-66 cont'd restoring pink salmon have not yet been developed, the stock of choice is the existing run. The Dungeness River stock would provide an acceptable alternate with efforts currently underway to improve the size of the run. Other stocks of pink salmon may also provide sources of brood.

NMF-67 Page 4-103, Stock Selection and Availability: See comments for Page 3-39 above.

NMF-68 Page 4-103, Sockeye: We do not agree that sockeye salmon habitat should be rated as poor. See comments for Page 4-31 above. We believe that the potential for successful restoration of sockeye salmon following dam removal should be rated as fair.

NMF-69 Page 4-104, Stream Ecology: If removal of the dams will decrease water temperatures from 2 to 4° C (as noted in the DEIS), it is not clear how removal of the dams will also result in the increased frequency of daily maximum temperatures in the lower river from 16 to 20° C. Production of benthic invertebrates in the middle reach has been reduced with the presence of the dams since suitable substrate material for invertebrate colonization has been prevented from reaching that area of the river. Allowing the natural redistribution of sediments to occur will increase benthic production. The reintroduction of anadromous fish and the influx of nutrients that will bring will substantially benefit invertebrate production. Therefore, spawning fish will result in a net increase in benthic invertebrate production.

NMF-70 Page 4-106, Unavoidable Adverse Impacts: See comments for Page xxxvi above.

NMF-71 Page 4-131, Unavoidable Adverse Impacts: The DEIS considers elimination of the reservoirs to be an adverse aesthetic impact. It is not clear how it was determined that man-made structures and the associated ponding of water are more appealing than a free flowing river with its associated wetlands, riparian areas, and abundant fish and wildlife. The DEIS should describe how this conclusion was generated.

NMF-72 Page 4-133, Fisheries: Spring chinook are highly valued by recreational fishermen because they return in a "bright" condition at a time when other salmon are not available. The opportunity to catch near legendary Elwha chinook would likely be very attractive to recreational fishermen.

NMF-73 Page 4-134, Table 4-21: Many different potential production estimates are possible, depending on the methodology used. Given the inherent variability in estimates of this kind, the potential production estimates used by Commission staff are reasonable.

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NMF-67: Whether failure of past stocking efforts of chum salmon can be only attributed to the wrong stock has not been determined. The fact that an effort to produce a run of chum failed suggests that some problems might be a function of the stock selection. Many commentors have stated that other non-native stocks (e.g., coho and pink salmon) can be used to restore runs to the Elwha, but this comment implies that using the wrong stock caused the failure. Whether another stock could be successful would not ultimately be known until they are tried. The example of the past chum failure suggests that future transfer of chum stocks has a chance for failure. The staff does not believe that state-of-the-art methods can absolutely ensure that any stock transfer would definitely work, no matter how close it appear to be to the native stock. Thus, the rating of marginal for the chum stock is appropriate. However, with the improvement of habitat conditions and other favorable factors, the staff believes the importance of the stock is reduced, resulting in an overall "good" rating for restoration potential.

NMF-68: The staff believes the overall rating is reasonable but acknowledges that uncertainty exists. See responses DOI-53 and DOI-154.

NMF-69: See text changes in Section 4.2.3.2.

NMF-70: See text changes in Section 4.2.3.4 and response DOI-205.

NMF-71: The text has been modified to reflect the fact that different viewers view the same objects and scenery differently.

NMF-72: The text of Section 4.2.8.2 has been revised to reflect this point.

NMF-73: Comment noted.

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NMF-74 Page 4-135, Tribal Social Effects: The DEIS incorrectly assumes that the Tribe would lose income and employment if restoration occurs because production at the tribal hatchery would have to be curtailed. If the dams are removed, the Tribe has the opportunity to reprogram the hatchery to produce fish for restoration or enhancement efforts in other Strait of Juan de Fuca streams or for delayed release net pen projects in marine areas. Both of these activities would further increase harvest opportunities, an additional benefit to the Tribe accruing from Elwha fish restoration with the dams removed.

NMF-75 Page 4-171, Aquatic Communities: The conclusion that "[t]he overall restoration prospects [with removal of Elwha Dam and retention of Glines Dam] would be similar to those associated with the removal of both dams..." is incorrect. Reservoir mortality in Lake Mills, unproven passage success with 100 cfs spill, lack of screens at Glines Dam, increased water temperatures, reservoir level fluctuations, and continued habitat degradation below Glines Dam all significantly differ from the removal of both dams alternative.

NMF-76 Page 5-1, Summary and Staff Conclusions: At issue in the DEIS is not only the extent of fish restoration, but also the availability of replacement power for the Daishowa mill, and the relative risks and uncertainty associated with each of these. Both issues must be viewed in their historical context, since the need for restoration has been entirely caused by the presence and operation of the projects.

NMF-77 Page 5-5, Restoration of Anadromy: We generally agree with the conclusions in the DEIS regarding the potential for restoration with both dams removed and under the Applicant's proposal. However, we believe the conclusions concerning the single removal of either Elwha Dam or Glines Dam are overly optimistic. Under either single dam retention alternative, many of the same adverse impacts associated with the Applicant's proposal would remain, including, but not limited to, those listed in our comments on page 4-171 above. Restoration of pink and chum salmon would continue to be unrealistic.

NMF-78 Page 5-8, Hydroelectric Generation: We see no basis in the DEIS for the conclusion that the Elwha projects reduce air pollutants from thermal production. In fact, a complete reading of the DEIS' discussions of available power alternatives indicates that effects on thermal power production are unlikely at best. Page 5-13 includes a more accurate summary.

NMF-79 Page 5-14, Effects on Power Generation: We agree with the first paragraph, but recommend deleting the second. Thermal plant impacts associated with dam removal are extremely unlikely given the region's resource portfolio and priorities under the

NMF-74: The text of Section 4.2.8.2 has been revised to reflect this point.

NMF-75: The text has been changed in Section 4.3.3.

NMF-76: The staff concurs and text has been modified.

NMF-77: The text has been changed. The staff, however, believes the overall assessment reasonable. As stated, the potential restoration of pink and chum salmon is "fair which is only one category above "poor." The staff believes this is a reasonable rating, considering all factors.

NMF-78: Section 5.1.3 has been modified to indicate that air pollution reduction is a poten outcome.

NMF-79: The staff believes that the referenced paragraph accurately summarizes the effect associated with the range of potential conservation and generating resources that could be affected by loss of the hydroelectric generation.

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NMF-79 cont'd — Northwest Power Act. The prospects of damaging new hydro development are also highly speculative, at least within the Northwest, due to the protected areas provisions of the Regional Energy Plan and continued oversight/appeals by the region's agencies and tribes.

NMF-80 — Page 5-15, Consistency with Comprehensive Plans: We agree that removal of both dams would be most consistent with the relevant plans.

NMF-81 — Page 5-23, Table 5-7: As noted above, we disagree with the inclusion of foregone generation in this table, and in the calculation of "total net costs". We also suggest that costs of staff recommended mitigation (including costs for conventional screens, improvements to the Applicant's ladder design for Elwha Dam, operation of Lake Mills run-of-the-river, monitoring activities, fish restoration, etc.) be included in the first column. The economic benefits (e.g., reduced costs associated with protection of Ediz Hook) should also be factored in.

NMF-82 — Page 5-24, Implementation of the Commission's Decision: The DEIS should note that "full licensee responsibility" is what the Federal Power Act envisions. Just as for any power plant, owner/operators are responsible for decommissioning expenses.

NMF-83 — Page 5-24, Preliminary Findings: We generally agree with conclusions 1, 3, 5, and 6. However, we disagree with conclusions 2 and 4.

Conclusion 2: We do not agree that the Applicant's proposal will result in "meaningful improvement" over the current conditions for fish and wildlife. The DEIS clearly indicates that restoration of even the four stocks (summer/fall chinook and coho salmon, winter and summer steelhead) is questionable. Even if restoration is successful, these runs would not represent significant harvest opportunities and would only result in "partial" ecosystem restoration. We do not consider this to be a "meaningful improvement."

NMF-84 — Conclusion 3: Some of the Commission staff's recommended improvements to the Applicant's proposal were not mentioned, but should have been (e.g., operate Lake Mills run-of-the-river, reevaluate spill at Glines, various monitoring studies, longer time period for fish restoration). Measures recommended by the JFWA should also be included (e.g., supplementation of gravel and large woody debris, additional modifications of passage facilities, mitigation for the estuary and reservation beaches, additional wildlife mitigation).

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NMF-80: Comment noted.

NMF-81: Refer to responses DOI-7, DOI-8, and DOI-9.

NMF-82: It is not apparent to the staff that the Federal Power Act envisions a licensee bearing all costs in the event of federal takeover.

NMF-83: The text has been modified.

NMF-84: Reference to a table of staff-recommended measures has been added.

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NMF-85 Conclusion 4: We disagree with the statement that dam removal is "...associated with extremely high costs, technical challenges of a high order, and very substantial adverse impacts during and immediately after removal." We agree that if the costs of dam removal approached those purported by the Applicant (at least one statement to the press included a $600 million estimate), they would be excessive. However, the DEIS estimates the cost at $64.3 million. Although this amount of money is not insignificant, it would result in fish, wildlife, and ecosystem restoration becoming a certainty. The comments relating to the technical aspects and adverse impacts of dam removal are simply not supported by the facts as presented in the rest of the DEIS.

NMF-86 In a related issue, representatives of the Applicant commented to Commission staff at the April 4 workshop in Seattle that the DEIS is insufficient because it does not contain a detailed fish restoration plan in the event the dams are removed. We disagree. The specific technical details for restoration with the dams removed, or with dam retention, are not necessary for informed decision making on the licensing issue before the Commission. Even if such details were necessary, it is apparent that the technical details of a restoration effort are much more complex, difficult, and costly with the dams retained than if they are removed. The Applicant has failed to provide this information to the Commission.

NMF-87 Conclusion 5: In addition to the public interest, the Commission must consider consistency with treaty fishing rights.

NMF-88 Conclusion 6: Both single dam removal scenarios perform poorly in terms of fish, wildlife, and ecosystem restoration. In addition, each single dam removal scenario results in significant cost increases for the power generated by the single project that would remain.

Appendix A

We have previously provided extensive comments on the state-of-the-art fish passage facilities that would be necessary if the dams remain and on the Applicant's proposal. These comments are summarized below for incorporation into the FEIS.

State-of-the-Art Fish Passage

NMF-89 The construction and operation of the dams on the Elwha River has produced many adverse impacts on the physical and biological characteristics of the Elwha and is the major impediment to the restoration of natural fish production. With the dams in place, the suitability of fish passage facilities is a major factor in

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NMF-85: The referenced statement has been modified.

NMF-86: The staff believes without a restoration plan for dam removal, Commission decisions are impeded. The staff formally requested such a plan (at least at the level supplied by the applicant) from the resource agencies. This information wa not supplied by any agency. The staff, therefore, developed an independent restoration plan for dam removal to try to balance the information for restoration with dam retention with information about dam removal. The staff restoration pl supplies comparable and reasonable procedures and guidelines for cost that could followed if dam removal were to occur (Appendix A, Part 3.3). It appears to th staff that restoration with dam removal also would have substantial costs and complexity if restoration of all stocks, as indicated by the agencies, is the goal. There will also be substantial risks to some stocks because of removal activity th does not occur for dam retention.

NMF-87: The tribe's position with respect to treaty fishing rights is reported in Section 4.1.9.2.

NMF-88: Comment noted.

NMF-89: The staff concurs that suitable upstream and downstream passage needs to be supplied at these projects (see Section 4.1.3.3).

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NMF-89 cont'd

survival rates and so restoration prospects. The primary objective of a fishway at a dam is to provide passage without delay and with no physical impairment of the fish. If passage is not properly implemented, the facilities can result in serious obstacles to restoration of anadromous fish runs on the Elwha River. However, it should be kept in mind that even state-of-the-art fishways may not be adequate. Clay (1961) stated, "In some instances it may be apparent that the best facilities for fish passage cannot assure perpetuation of the fishery."
As noted, fishways should provide passage without injury or delay. This is rarely the case, however, since virtually all passage facilities result in some delays and/or losses. Therefore, the best agencies can hope to achieve, when prescribing fishway conditions, is to minimize fish losses based upon proven technologies. We have summarized below the facilities needed to minimize losses at both the Elwha and Glines dams.

Generally, upstream and downstream passage facilities will be required at both dams, if they remain, to restore as much of the fish production of the river as possible. To do so, fish must be allowed to naturally distribute within the entire river basin. Also, as the fish move upstream and downstream past each project, mortalities associated with reservoir, turbine, spillway, and fishways must be minimized.

NMF-90

Upstream Passage: Tailrace barriers are necessary at both project powerhouses to prevent fish from entering the draft tubes and becoming injured. The tailrace barriers must not obstruct passage to the adult fishways. Both racks must be equipped with automatic mechanical rakes or similar cleaning methods since manually maintaining clean racks would be impossible. Only the large debris will be excluded at the penstock intakes, with much of the smaller debris (leaves, sticks, etc.) accumulating on these tailrace racks.

It should be noted that there is a gradient across the front of the Elwha powerhouse, at least at low flows. A significant amount of rock excavation may be required within the tailrace to eliminate this gradient.

Adult fishways should be designed to provide unimpeded passage upstream for all species. Ladders are generally the best technology to do this at dams. Since the Elwha Dam is only approximately 100 feet in height and the site does not impose any major obstacles to construction, a pool and weir type ladder designed to pass all anadromous fish species in the river should be provided at Elwha Dam.

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NMF-90: The final design for a tailrace barrier would be developed in consultation with the agencies. The design developed for the Elwha ladder by the staff is suitable for passage. The staff does not believe a second left bank entrance at the Elwha Proje is justified (see Section 4.1.3.3).

The staff concurs that the trap-and-haul design at Glines Canyon needs to be improved in consultation with the agencies including a suitable weir to prevent fish from reaching the base of the dam.

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NMF-90

The Elwha ladder entrance structure should have an entrance pool and an entrance opening appropriately located at the south end of the powerhouse tailrace barrier rack to attract fish from the area immediately downstream of the rack. The entrance should be gate controlled to automatically maintain the head differential to the desired criteria (normally 1.0 feet) for the full range of tailwater elevations. An entrance flow of 100 cfs is appropriate as a minimum for a project of this scale. Additionally, the fishway must include flow control through the expected range of forebay elevations, to insure adequate fishway flows. The amount of fluctuation must be documented and accounted for in the exit and fishway flow control.

A second entrance must be provided to the adult fishway at the opposite end of the tailrace rack to attract from this area. This entrance would also need to be designed to discharge the same minimum 100 cfs as the first entrance and be gated for hydraulic control of the entrance head.

Glines Canyon Dam is about 200 feet in height. Although a ladder should theoretically provide adequate passage at Glines, we are unaware of any functional ladders of this height. But this may be more a function of economics than feasibility. Construction of a ladder at this site could also prove difficult. Therefore, the JFWA previously recommended that a trap-and-haul facility be provided at Glines, although we acknowledge that significant fish losses could result. James River has estimated that a similar facility at Elwha Dam would result in upstream migrant losses ranging from 4.3% for coho to 25.0% for spring chinook salmon (Hosey 1988a, 1988b).

Fish collection and counting facilities are necessary at both adult fishways for the collection of broodstock and transportation by species. Several holding pools will be required at each facility so that fish are only sorted once, to minimize injury and stress to fish.

Most recent designs of sorting and trapping facilities incorporate an off-ladder collection pool with a false weir and sorting flume with selector gates to divert selected fish to separate holding pools for transport as desired, or to return the fish to the main ladder. These designs are aimed at avoiding stress, injury, and delay. Similar type facilities would be appropriate at these dams. Exactly how they are designed is very critical to their success; the functional design needs to be developed in some detail.

NMF-90 cont'd

Barrier weirs must also be provided at each project. At Elwha Dam, fish must be prevented from attempting to migrate up the right bank spillway. The barrier weir crest elevation and/or crest shape must provide an adequate fish barrier at high tailwater elevations, in the event the right bank spillway is operated. This spillway was used as recently as November 1990, and perhaps more recently. At Glines, adult fishways would be located a short distance downstream of the dam. Fish must be prevented from reaching the base of the dam where there would be no provision for passage.

NMF-91

Downstream Passage: Generally, for projects such as Elwha and Glines, state-of-the-art downstream fish passage should provide about 98% passage survival over spillways and 95%-97% passage survival past screens and bypass systems. Therefore, at a minimum, passage survival past each project should not be less than 95%.

The JFWA have requested that functional designs of a conventional screen facility be developed, consistent with NMFS's fish screening criteria. James River has refused to develop this information. Without a functional design, we can only discuss the general concepts of the facilities.

Studies by the FWS have indicated that only about 10% of the chinook passing downstream exit through the Glines turbine. However, the mortality rate on these fish is approximately 60%. Therefore, even if only 10% of the outmigration exits through the turbine, a 60% turbine loss would cause a very significant 6% mortality of all chinook outmigrants passing Glines. Additional fish would be lost during reservoir and spillway passage. Therefore, fish must be prevented from entering the Glines turbine.

In contrast, most (about 95%) of the juvenile fish migrating past Elwha Dam pass through the turbines. In tests by FWS, only 71.5% to 86.9% of the coho salmon passing the turbines survived. Therefore, fish screens and bypass must be provided at Elwha Dam.

In addition to screens and bypass, the spillways at both projects are concerns. At flows of 100 cfs, the FWS found that coho survival was about 95% at the Glines spillway. Mortality at flows greater than 450 cfs was not detectable. James River removed some rock at the spillway plunge pool outlet to improve passage survival at 100 cfs. However, it has not been documented if the rock excavation improved passage survival. Without any analyses verifying improvement in spillway passage survival at Glines, 450 cfs spill must be provided to pass downstream migrants.

NMF-91: The staff believes systems proposed by the applicant as modified by the staff proposal at Elwha and Glines Canyon dams for downstream passage supply adequate protection for stocks (see Section 4.1.3.3 and Appendix B).

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NMF-91 cont'd

Survival at the Elwha left-bank spillway ranged from 85.2% to 88.0% in a study by the FWS. This spillway must be provided with ogee crests functional over the range of flows released, retaining walls the length of the spillway to confine flows, smoothed spillway floors, and elimination of the sharp bend in the spillway wall. Also, further analysis is necessary to determine the modifications to the spillway gates necessary to minimize injuries to fish. Once these improvements are completed, studies are needed to determine if additional modifications are necessary. The right-bank spillway must not be operated and overtopping of the dam must not occur whenever fish are present.

Once the fishways (both adult and juvenile facilities) are constructed, evaluations must be conducted to determine the operating standards (bypass flow, gate openings, etc.) necessary to meet biological criteria. A monitoring program is needed for the life of the projects to insure that the operating standards are met. However, passage over time may become less effective, because of other factors or changed conditions, even though the physical operating standards originally established are maintained. James River must provide good passage at all times.

Applicant Proposal

The JFWA have previously commented extensively on James River's proposed fish passage facilities. For detailed critiques of these facilities, please see our August 16, 1988 "Comments to Response to FERC Request for Additional Information of May 28, 1987, FERC No. 2683 and FERC No. 588", our February 27, 1990 comments on FERC's Scoping Document 1, and our June 12, 1990 comments on James River's "Agency Review Draft Response to February 1, 1990 Request for Additional Information Item 1, Fish Passage and Restoration Plan".

NMF-92

Upstream Passage: James River has proposed to provide tailrace barriers at both powerhouses. We concur with this need but note that additional design detail is necessary to fully evaluate the structures. However, James River has proposed to manually clean the Elwha tailrace rack. This is not acceptable. Automatic mechanical cleaning devices are needed at both tailrace racks to keep them clean.

James River has proposed a ladder at Elwha Dam to pass adult migrants upstream. The JFWA agree with the concept of a ladder at Elwha, but James River's design needs refinement. In particular, the use of a denil ladder at this site is not

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NMF-92: The staff concurs that final design of tailrace barriers for both the turbines and upstream passage would be needed before construction begins.

However, automatic cleaning devices are not needed at the turbine barriers. With placement of the Eicher screens at Elwha dam, little material could pass through the turbines that would clog barriers. The 1-inch bar spacing would let material that is passed through the turbines be easily passed. The reservoirs would also greatly reduce the amount of material reaching the turbine intakes by the increased settling that would occur relative to a river. Although Eicher screens would not be available at Glines Canyon dam, the other factors plus depth of intake (which would reduce floating matter reaching the intake) would greatly reduce material that could impinge on the bars of a tailrace barrier below the turbines (see Section 4.1.3.3).

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and-haul facility at Glines, consistent with the JFWA recommendation at this time. However, a trap-and-haul facility could result in significant and unacceptable adult mortalities (see above). The adult collection and counting facilities proposed by James River are also inadequate.

NMF-92 cont'd

Although James River has proposed barrier weirs at both projects, the proposed designs require refinement. Also, we have concerns with James River's proposed electrical barrier at Glines. The concern is with the potential for fish injury due to the electric field. Other electric barrier designs have in some instances caused serious spinal injuries to adult salmon. We are not aware of any comprehensive evaluations of James River's proposed design that would assure no injury potential would exist. The velocity barrier concept is the most appropriate approach from the point of fish safety, but the information provided by James River is insufficient to allow us to evaluate the expected adequacy of the dam as a barrier to fish passage. This lack of information also prevents the determination of the range of flows that would require activation of the electric field, and the frequency and duration of its operation, and thus its potential for impact on fish. These characteristics of the barrier dam need to be established.

NMF-93

Downstream Passage: James River does not propose to provide any screen and bypass system at Glines. As discussed above, this is not acceptable. With regard to spill, James River has proposed to spill only 100 cfs at Glines. This proposal is also unacceptable at this time for the reasons discussed above.

James River has proposed to install an Eicher Screen system at Elwha Dam to prevent fish from encountering the turbines. However, at least two more years of evaluation are necessary to determine the adequacy of this unproven technology at Elwha Dam. James River has not proposed alternative screening concepts in the event the Eicher Screen system does not prove effective. This is unacceptable.

Once all of the passage facilities are installed and operating criteria developed, James River proposes no further evaluation beyond documenting that the criteria are met. This position is unacceptable (see above).

Appendix B

NMF-94

Page B-2, Lake Mills Juvenile Chinook Passage Survival: Because of uncertainties in stream survival of chinook, lack of any site-specific measures of reservoir survival for chinook, and assumptions about outmigration behavior of Elwha chinook inferred from studies at Glines Dam, passage survival through

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NMF-93: Further evaluation has been included in the staff plan and a back-up screen plan has been provided at Elwha dam by the staff (see Section 4.1.3.3).

NMF-94: Refer to responses DOI-273 and 274.

NMF-94 cont'd

Lake Mills could be much lower than suggested in the DEIS. Using juvenile chinook survival rates from the Lemhi River is probably not appropriate because of differing environmental conditions. No direct measures of juvenile chinook survival in the Elwha are available, although fry plants of both coho salmon and steelhead suggest above average survival-to-smolt (Wunderlich and Dilley 1986, Wunderlich et al. 1989). Summer-to-fall wild coho survival in the nearby Bogachiel and Queets Rivers averaged 33% (Wampler et al. 1990). Even slightly higher freshwater survival prior to reservoir passage would markedly raise estimates of reservoir mortality rates for Elwha chinook.

The DEIS incorrectly assumes that no reservoir losses of chinook occurred in the 1989-90 chinook outmigration through Lake Mills. The late-summer outmigration of chinook in the Columbia River, as occurs in the Elwha, results in reservoir mortalities over 60% in some instances (Reiman et al. 1988) because predator activity is highest at that time, chinook are dispersed so predators are not "swamped" with prey as during the spring outmigration, and downstream movement rates of chinook subyearlings are relatively slow compared to yearling and older smolts. Although there is a difference in the predator base in Lake Mills and Lake Aldwell, Dolly Varden and resident trout are relatively abundant. At least 16% of the Dolly Varden sampled by the Applicant in Lake Mills during the summer of 1989 had preyed on juvenile chinook.

The estimated loss of juvenile chinook during the 1987 chinook outmigration was probably underestimated. These chinook were released in the forebay of the reservoir in the immediate vicinity of the exits, and thus did not pass the length of the reservoir and encounter the full gamut of predators. In addition, the DEIS does not account for chinook passage which occurred between June 1 and June 15 of that year. An estimated 1,141 chinook passed through the dam during this period, which would result in a survival estimate of 68% rather than 71%.

NMF-95 Page B-4, Glines Canyon Dam Juvenile Chinook Passage Survival: See comments for page 2-13 above.

NMF-96 Page B-5, Glines Canyon Dam Juvenile Chinook Turbine Survival: Turbine survival is probably lower than that estimated in the DEIS. The turbine survival results noted were obtained in the spring with fish of 72 to 76 mm (Wunderlich and Dilley 1988). Although fish of this size emigrate in the spring, the dominant size of chinook during the late summer peak outmigration would actually range from about 100 to 125 mm. The greater size would result in increased mortalities.

NMF-95: Some adjustments were made in mortality factor based on the correlation of migration to spill for chinook in late summer. See Appendix B and response DOI-275.

Effects of spill quantity on other stocks was considered minor. The correlation of coho and steelhead migration with spill could easily be a correlation with total flow. Because the turbine was generally operating at full capacity when the stocks migrated, any change in flow into the reservoir would be reflected in increased spill. These fish were stocked in the river and would rear there before outmigration. Increases of river flow would tend to move fish into and through the reservoir; therefore, correlation to the actual quantity of spill is probably an artifact of total river flow, not spill.

Chinook outmigration was not correlated with spill in the spring but later in the year (Dilley and Wunderlich, 1990). Peak chinook outmigration occurred during periods of lowest spill (typically 150 to 250 cfs) in 1989 to 1990. Based on the estimated survival in the system this year, the spill quantity appeared to have minor if any effects on survival. However, the staff recommended higher spill than the applicant to ensure that similar survival occurs in the future, unless future tests determine otherwise.

The drawdown would have little if any effects on downstream migration. The following example will show that the likely effect on survival will be insignificant.

First, assume that the reservoir is drawn down 10 feet (this would occur only before Memorial Day in the spring) and that inflow during May, when the reservoir is down 10 feet, is less than the average 80 percent exceedance flow (about 1,500 cfs). Also, assume that the project is at maximum operation (1,100 cfs through the turbines and 100 cfs spill), resulting in 300 cfs available to fill the reservoir. Based on the reservoir volume it would be at full pool in 6 days. This also would result in a net 15-percent reduction of flow below the project for 6 days. The estimated change in flushing rate (i.e., average water particle travel time) through the two reservoirs during this period would increase from 15.5 to 17.9 days, an increase of 2.4 days for 6 days.

The staff does not know how exactly smolt migration rates correlate with the flushing rate in this system; however, on the Columbia River, it has been found that the yearling smolt migration rate through the reservoirs often correlates with flushing rate and may at times approximate the average water particle travel time.

NMF-95: cont'd If the staff assumes that smolts in the Elwha River migrated at the rate of the average water particle travel time, the average increase in time to migrate out of the system would increase by the average number of days, increased by water particle travel time—2.4 days. The overall effects on survival are less clear. Bell et al. (1976) estimated that yearling smolt mortality on the Columbia River system, independent of dam passage mortality, was 0.7 percent per day. The information from the Lemhi system indicates that rearing mortality is about 1.7 percent per day (Bjornn, 1978). If the staff uses the higher value, which is probably excessive for migrating juvenile chinook because they are larger than the rearing fish this was based on, the conservative two times the average density during the peak migration period (i.e., 4.7 percent passing the dam per day) for the 6-day period then the average loss would be 1.1 percent of the population. The staff considers this estimated loss, because of the many conservative factors, to be excessive but did include a minor adjustment in passage mortality.

While some delay in upstream adult migration could occur from capturing freshets from reservoir drawdown, the staff believes the overall effects on populations would be minor. Fish will migrate upstream even without freshets especially low-flow years. Only when flow gets low enough to inhibit passage over shallows are losses likely to occur. The capture of freshets will not occur during low flows because the reservoirs will be full during those periods, unless otherwise requested by the agencies for lower river flow augmentation. The overall river system is short, so minor delays could be easily made up later in the migration without reducing fish energy reserves. Also, major freshets would rapidly fill even a 10-foot drawdown, resulting in the transmission of increased flows downstream. For example, a 10-foot Lake Mills drawdown could be filled in 1.8 days with an additional 1,000 cfs over discharge from the project. The staff, however, has recommended that the reservoir be maintained at full pool because of concerns for passage and other reasons.

NMF-96: Refer to response DOI-278.

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NMF-97 Page B-5, Proportion of Juvenile Chinook through Spill and Turbine: The final exit selection value obtained in the study referenced was 89% spill and 11% turbine passage (Dilley and Wunderlich 1990). These values should be used instead of the values quoted. Also, the spill exit-selection value (89%) was obtained under run-of-the-river conditions with a higher minimum spill (175 cfs) and more frequent spill (24 hours per day during the spring and early summer) than the Applicant proposes. Therefore, the Applicant's proposed spill and reservoir level fluctuations may further reduce the proportion of chinook exiting the spillway.

NMF-98 Page B-7, Cumulative Chinook Passage Survival: Cumulative passage survival is likely lower than the 99% figure used in the DEIS. The referenced study (Wunderlich 1988) evaluated only coho smolt survival, and concluded that no substantial latent mortality was detected between short- and long-term survival estimates for coho smolts passing both dams. Monitoring studies indicate that chinook entered the Glines turbine at a somewhat greater rate than coho (11% versus 9%, respectively), and this would increase the likelihood of latent mortality because of substantial levels of scale loss and other injuries among fish passing the Glines turbine. As well, chinook passing via spill at Glines incurred higher levels of scale loss than did coho (Wunderlich and Dilley 1988, Wunderlich et al. 1989).

NMF-99 Page B-9, Glines Canyon Dam Juvenile Coho Turbine Survival: Survival of coho smolts may be less than 32% through the Glines turbine because they are substantially larger than the fingerling chinook that were used in turbine survival testing. Size is an important factor in survival through the Francis turbine (Bell 1984).

NMF-100 Page B-12, Glines Canyon Dam Juvenile Steelhead Passage Survival: The same comments above for coho survival apply here as well.

NMF-101 Page B-13, Proportion of Juvenile Steelhead through Spill and Turbine: A better measure of steelhead exit selection was conducted in 1988 when smolts from upriver fry plants were monitored throughout the outmigration season at Glines Dam (Wunderlich et al. 1989). The DEIS correctly infers that coho were also present during this monitoring period. However, these measurements were of smolts naturally outmigrating through the length of Lake Mills throughout the entire outmigration season. Therefore, Wunderlich et al. (1989) better reflects a natural outmigration pattern even though steelhead were not dominant. In contrast, the steelhead-only evaluation (Dilley and Wunderlich 1987) cited in the DEIS only looked at hatchery steelhead placed in the immediate vicinity of the Glines Dam exits. Wunderlich et al. (1989) suggest a spill selection value of 91.2% for steelhead.

NMF-97: Refer to response DOI-279. There has been some adjustment in exit selection. Generally, the lack of spill had little, if any, influence on exit selection based on the available information.

NMF-98: Refer to response DOI-281.

NMF-99: Refer to response DOI-283.

NMF-100: Refer to response NMF-95.

NMF-101: While the exit selection behavior of steelhead may be more representative of true wild steelhead, it is not possible from the information presented to separate coho from steelhead in this study. Only 1,400 steelhead of 24,000 migrants (coho plus steelhead) migrated past the Glines Canyon dam in 1988 (Wunderlich et al., 1989). The hydroacoustic results cannot separate the two stocks. Because the coho greatly outnumber the steelhead, the exit selection measured with this method can only be considered representative of coho.

We hope these comments are useful.

Sincerely,

Merritt E. Tuttle
Division Chief

cc: R. McKitrick, FERC
Ebasco
Service List

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OLYMPIC
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COUNCIL
P.O. Box 220 Hoodsport, WA. 98548-9998

March 17, 1991

Lois D. Cashell
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, DC 20426

RE: FERC #588 Glines Canyon project
FERC #2683 Elwha Dam project

The Olympic Rivers Council would like to make the following comments on the Draft EIS for the Glines Canyon (FERC #588) and the Elwha (FERC #2683) projects.

We enthusiastically support the removal of both the Glines Canyon and Elwha dams for the following reasons:

***You have defined the following three primary resource objectives: 1), the restoration of wild, self-sustaining runs of anadromous fish; 2) restoration of natural conditions within Olympic National Park; and 3) provision of renewable hydroelectric energy.

TWO OUT OF THREE OF THESE OBJECTIVES ARE BEST SERVED WITH THE REMOVAL OF BOTH DAMS.

***Before passing the Federal Power Act in 1920, Congress debated the role that private enterprise should have in developing rivers. Some legislators favored using mostly private capital. Others argued that since rivers are public resources, publicly owned enterprises were preferable. The Federal Power Act embodies a compromise between the two positions.

Private companies can build hydro dams, but they cannot "buy" a river. If power is to be harnessed, the developer must obtain a license. That is, government grants the limited right to alter the river for the recognized public good of producing electricity. However, since the definition of "public good" may change over the years, licenses have a maximum term of 50 years. When the license expires, the Commission must decide afresh how the resource should be managed, and by whom. Lest anyone think wresting a dam from its longtime owner is confiscatory, the law makes clear that no taking is involved. The dam owner is assumed to have amortized the capital investment and to

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have received an adequate return over the term of the original license.[1]

Private interests, in the case of the Glines Canyon dam, have had not the maximum intended term of 50 years, but 65 years to amortize their capital investment into company profits. The Elwha dam has provided 78 years of power production to its owners.

In 1986, Congress strengthened the language of section 4(e) with the enactment of the Electric Consumers Protection Act of 1986 (ECPA). The amendment was intended to make clear that the public interest will sometimes be served best by preserving free-flowing rivers rather than developing them for hydropower. The ECPA added: "in deciding whether to issue any license, the Commission, in addition to the power and development purposes for which licenses are issued, shall give EQUAL CONSIDERATION to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (includin related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality." The Federal Power Act directs the Commission to review an application based on what it determines is "desirable and justified in the public interest."[2]

ORC-1 CLEARLY, THE PUBLIC INTEREST HERE IS BEST-SERVED BY REMOVING BOTH ELWHA RIVER DAMS. ESPECIALLY SINCE ENERGY COSTS TO THE DAISHOWA MILL IS NOW A NON-ISSUE, THE ONLY PARTY THAT CONTINUES TO PROFIT FROM THE DAMS IS JAMES RIVER II, INC.

In addition to these general comments, we would like to specifically address several statements that were made in the Draft EIS:

ORC-2 **Page 3-75: "The upper Elwha River is regarded by the Olympic National Park and Olympic National Forest as suitable for designation as a wild & Scenic river, but a study of its eligibility and suitabilit has not been undertaken."

Actually, in its 1990 FEIS, the Olympic Forest Plan HAS pursued eligibility of the Elwha for Wild & Scenic. With scenic, geologic, wildlife, and (if the anadromous fish runs are restored) fish values rated as "outstandingly remarkable," the river has certainly been deemed eligible for Wild & Scenic designation.[3]

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ORC-1: Position in favor of dam removal is noted.

ORC-2: "Eligible" has been added to the discussion in Section 3.6.3.

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ORC-3 **Page 4-126: " . . . the middle reach of the Elwha River could be potentially eligible for federal wild & scenic river designation."

The free-flowing river between Lake Mills and Lake Aldwell, because "outstandingly remarkable" values are present, already make this section eligible for federal wild & scenic designation.

ORC-4 **Page 4-126: "The lower reach of the Elwha would still not be eligible for wild & scenic river status because of the presence of the low diversion dam, associated with the municipal and industrial water withdrawal, at RM 3.4."

The Forest Service is mistaken in this analysis. The eligibility of a river for Wild & Scenic designation depends on the river being 1) free-flowing, and 2)having at least one "outstandingly remarkable" value. The lower Elwha IS free-flowing (even with the presence of this small diversion dam) and has several "outstandingly remarkable" values. The presence of the small diversion dam does not affect its eligibility. It does, however, affect this lower river segment's classification. "There may be some existing impoundments, diversions and other modifications of the waterway having an impact on the river area. Existing low dams, diversion works, rip-rap and other minor structures will not bar recreational classification, provided the waterway remains generally natural and riverine in appearance."[4]

ORC-5 **Regarding whitewater boating on the Olympic Peninsula, and the Elwha in particular:

In general, whitewater boating is a largely misunderstood sport on the Olympic Peninsula. This became evident when the Olympic Forest Plan Draft EIS became available in 1986, when the Final Plan was released in 1990, and now as the Elwha EIS is released.

On the Olympic Peninsula, whitewater boating (which includes rafting, canoeing, kayaking) is principally a winter and spring sport. Whitewater enthusiasts are out in highest numbers when few other people would even want to be . . . this is due to the fact that many of the whitewater river runs on the Peninsula are rain-responsive and are thus best boated in the winter season. There is very little whitewater boating available on the Peninsula in the warmer months--and, why, we believe, the impact of whitewater recreation is grossly underestimated on the Peninsula. Summer whitewater boating generally involves only 1) running exceptionally steep river sections that

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ORC-3: The USFS has not found the middle reach eligible (USFS, 1990).

ORC-4: Comment noted; however, the USFS, a responsible federal agency, has not found this section eligible, and no other eligibility recommendations have been made for this section.

ORC-5: Winter and spring use patterns have been added to Section 3.7.2. Other local river use has been added to Section 4.2.6.1. Section 5.2.6 has been revised to refer to the spring and summer use as the primary use season. Although other seasons are important to some users, primary usage is in the summer.

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ORC-5 cont'd

would be too dangerous at higher flows (like the Grand Canyon and Rica Canyon stretches above Lake Mills on the Elwha) and 2) ocean surfing.

Whitewater kayaking is one of the fastest-growing recreational sports in our state, and larger and larger numbers of kayakers frequent the Peninsula in winter--adding tourism dollars to Peninsula communities in the non-tourist season.

Your comment on Page 4-129, "Whitewater boaters would have few other comparable rivers in the area to choose from and would have to either use the Soleduck or Bogachiel rivers or travel over 75 miles to the Queets, Quinault or Humptulips rivers for rafting opportunities" admits your lack of whitewater knowledge on the Olympic Peninsula. What happened to the nearby Dungeness, the Sitkum, the Calawah, the Dosewallips, the Hamma Hamma, etc. --and the Queets and Quinault, although their tributaries sport good whitewater boating, are far from "whitewater" runs.

Your comment on Page 5-12 "The middle reach of the Elwha River is utilized for whitewater boating during the late spring and summer months" is certainly true. Again, however, the winter rainy months provide the best whitewater use levels on the Elwha. And, although the middle reach is the only section frequently done on a commercial rafting basis, it is important to note that several other sections of the Elwha are also utilized for their whitewater: 1) the Grand Canyon and Rica Canyon above Lake Mills. Expert kayakers carry their boats in to run this pristine, challenging gorge, and 2) the lower Elwha below Lake Aldwell--this is a class II section, and 3) the Elwha surf. Given the right conditions, the outflowing river currents accentuate inflowing swells to create ideal surfing conditions for surfers and kayakers.

ORC-6

**Page 4-42: " . . . most of the land owned by James River would be managed for timber production. . . within 5 years."

It seems ironic that James River is willing to develop wildlife habitat on its Lake Aldwell acreage with dam retention, yet will manage these lands for timber production in the event of dam removal. This logging would be in violation of two out of three primary resource objectives of this entire issue.

With dam removal, it seems especially critical to protect this acreage from timber harvest 1) to avoid even higher sediment levels in the river and to provide a mature buffer above the unstable construction area, 2) to maintain scenic qualities and restoration of natural conditions, and 3) to aid in maintaining good fish and wildlife habitat. The entire Elwha will be eligible for Wild & Scenic designation after dam removal. Riverside clearcutting could degrade

ORC-6: If the projects are removed James River is under no obligation to provide a habitat improvement/protection plan or meet any of the licensing resource objectives. The would, however, have to meet the requirements of the Forest Practices Act and other applicable timber regulations.

The staff agrees that it would be a good idea to protect the land surrounding Lake Aldwell from logging if the dams are removed. See response SOW-184.

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cont'd the classification of this segment from "scenic" to "recreational."

ORC-7 **It is of interest that only the Commission itself (1990) has ruled that it has the authority to relicense Glines Canyon dam.

ORC-8 **Page 5-12: " . . . the replacement of the blue waters of Lake Mills with an early successional forest on large terraces would be considered an adverse effect by most viewers."

We disagree with this statement. The majority of Lake Mills viewers appreciate Lake Mills for what it is--a man-made lake. They are generally in the Lake Mills area en route to more pristine areas in the Park. These viewers would most likely welcome the temporary changes associated with dam removal, knowing that the long-term, eventual outcome would be preferred.

ORC-9 **Page 5-23: "At $245 million, the highest cost alternative would be removal of both dams. Approximately two-thirds of this alternative's total cost would be associated with the loss of all power generation, while the remaining one-third would consist largely of the capital cost of dam removal.

Two comments on this $245 million figure: 1) Is the 2/3 cost associated with the loss of power generation a true cost--or simply a future loss of profits to the James River Company? Future lost profits to the private faction that has had the opportunity to profit from the hydro potential of the Elwha for 78 years should not be considered a true "cost" of the removal option, and 2) no attempt has been made to assign dollar estimates to the improved nondevelopmental values associated with dam removal; yet the fishing, recreational and aesthetic potential will very directly have a positive effect on the tourism income of the Sequim/Port Angeles area.

ORC-10 **Page 2-21: Regarding the proposed construction schedule for the removal of both dams: The Elwha project appears quiet for all of year 1. Even if no drawdown occurs until year 3, it seems that road construction/construction of the diversion tunnel, etc, could begin in year 1. Although your construction schedule takes many issues into account--none of which ORC has the expertise to comment upon--time DOES seem to be of essence. Any step that can be taken, safely, AHEAD of schedule, should be taken to assure on-schedule completion of the project. Five years seems like a long time before restoration of anadromy can begin--the sooner we start, the sooner our anadromy goals will be realized!

ORC-7: Comment noted.

ORC-8: Refer to response CI-98.

ORC-9: The staff views the value of foregone generation as a true cost to the region, because regional resources (even if they come partly from the mill itself) will have to make up the difference.

The comment correctly notes that the EIS generally relies on verbal descriptions of resource benefits, rather than dollar estimates, to characterize the nondevelopmental effects.

ORC-10: The proposed construction schedule (Section 2.3.4) has been revised and the overall time has been shortened, based on a revised construction sequence. The apparent delay in activities at the Elwha site are based on the assumptions that tunneling is the selected diversion method at each location and that the same equipment and crew would perform the tunneling at each site. A precise overall construction schedule, however, could not be established until the final design stage for removal activities is underway.

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We appreciate the opportunity to comment on the DEIS. The document as a whole seems valid and objective.

If Olympic Rivers Council members can be of assistance in any respect on this project, please call on us. Also, if the removal of the Elwha dams is the outcome of this process, ORC would be willing to provide non-technical, volunteer aid for the project (tree-planting, mulching, etc.) that may be necessary.

In support of a free-flowing Elwha,

Carol Volk, DVM

Carol Volk, D.V.M.
Chair, steering committee

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Resources:

1. Echeverria, John D., Pope Barrow, and Richard Roos-Collins; Rivers at Risk, copyright 1989, Island Press, Pages 11-12.

2. Echeverria, John D., et. al, Rivers at Risk, Pages 44-46.

3. 1990 Olympic Forest Plan, Appendix F, Wild & Scenic Rivers Review, Pages F16--F18.

4. Federal Register; Volume 47, Number 173, Page 39458.

5. Korb, Gary; Paddler's Guide to the Olympic Peninsula; copyright 1986, Page 8.

PORT OF PORT ANGELES

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ANDREW NISBET, Sequim

April 23, 1991

Lois D. Cashell
Secretary of Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

RE: Draft EIS, Project Nos. 588 and 2682

Dear Lois Cashell:

The Port of Port Angeles has reviewed the draft environmental impact statement issued by the Office of Hydropower Licensing on February 22, 1991 for the Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) hydroelectric projects in the State of Washington. The port commissioners have concerns about the following issues:

1. Replacement Power

PPA-1 The Replacement Power, Section 2.6, needs further analysis. All of the emphasis is on total power needs in the region. Section 2.6 needs to also consider peak-period demand. For example, an article by Todd Litman in the March - April 1991 (Vol. 14, No. 2) Dispatch, Washington State Energy Office points out, "The surplus of electrical transmission capacity that the Pacific Northwest has long enjoyed is now depleted." The author continues, "Since electrical demand is increasing steadily in Western Washington and no new major power lines or generating facilities have been built since 1977, our power system has lost the margin of extra capacity that is needed to guarantee a reliable supply of power under all conditions." Litman warns that, "Under worst-case conditions a simple failure (of major system components) during a winter storm could trigger an uncontrolled 'voltage collapse', causing sudden blackouts."

PPA-2 Also, included in the article is a description of a Washington State Energy Office and Bonneville Power Administration "Puget Sound Area Electric Reliability Plan." One of the strategies is an emphasis on local generation. About two-thirds of the power consumed in the Puget Sound area during periods of high demand currently comes from outside the region. This creates problems due to the long distances between generators and consumers. The strategy calls for enhancing the system capacity and reliability by increasing generation in Western Washington. How seriously does the impact of removing the power production from the Elwha and Glines Canyon dams affect this Washington State/Bonneville Power Administration electric reliability plan?

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PPA-1: **Potential voltage stability problems of the Port Angeles area are described in Section 4.5.2**

PPA-2: **As described in EIS Section 4.5.2, the effects of the local electrical system from removal of the hydroelectric projects would be small and partly mitigable.**

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Lois Cashell
April 23, 1991
Page -2-

2. Water Quantity/Quality

PPA-3 There is insufficient information provided to allow the average citizen to evaluate the scale of the water quantity/quality impacts on City of Port Angeles and the industrial water users. Increased costs to the city are provided in Section 4.2.2.4, but how does this relate to the total water system costs? Would the increased costs mean an increase in charges for city water customers? Would the increased costs to the ITT Rayonier pulp mill and the Daishowa America papermill affect the pricing and therefore the competitiveness of their manufactured products?

PPA-4 In section 4.2.2.2 which discusses water quantity there is a statement that "flow augmentation would not be possible during low-flow periods due to the lack of storage currently provided by Lake Mills." Does this mean water supply would be restricted to the City of Port Angeles system and the industrial water users? If so how would the city and the industries meet their needs during drought conditions?

3. Aquatic Communities

PPA-5 In Section 4.2.3 there is a sentence that states, "Over the long term there would be a good potential for restoring all original salmon runs, except sockeye, and good-to-excellent potential for restoring summer and winter steelhead and sea-run cutthroat and Dolly Varden trout." This apparently assumes there will be developed a rational system for the management and conservation of the marine fisheries of the United States. However, since the present practices have caused grave depletions and damage to stocks, there is a need to elaborate on changes in fishery management plans that would be necessary to allow the restoration of salmon.

We hope the port commission's concerns and questions will be addressed in the final environmental impact statement. Thank you for this opportunity to comment.

Sincerely,

PORT OF PORT ANGELES

D. G. Hendricks
Executive Director

DGH:sb

RESPONSES TO PORT OF PORT ANGELES

PPA-3: Section 4.2.2.3 addresses these concerns in greater detail and proposes measures and associated costs to minimize impacts to industrial water users. Effects to users of drinking water would be minimal, with the exception of periodic changes in taste and odor due to chlorination. The City currently does not chlorinate water obtained from the Elwha River for drinking.

PPA-4: Flow augmentation would not be required to meet the water requirements of the City of Port Angeles given the current demand for Elwha River water. Under current and proposed operation by the applicant, the two reservoirs would not be used to provide additional water to the City under drought conditions. However, usage of all water rights currently existing for Elwha River waters and shortages in water supply are conceivable under drought conditions.

PPA-5: The staff has elaborated to some degree on plans presented in Sections 4.1.8.1 and 4.1.8.2, and a restoration plan for dam removal was developed in Appendix A, Part 3.3. The staff does not believe more detail is needed. It should be noted that strides have been made through the Pacific Salmon Treaty (also known as the U.S./Canada Pacific Salmon Treaty) to reduce harvest on wild stocks and to maintain runs.

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June 27, 1991

VIA FEDERAL EXPRESS

Ms. Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, NE
Washington, D.C. 20426

Re: Comments of the Puyallup Tribe of Indians on the Draft Environmental Impact Statement for the Glines Canyon Dam (FERC No. 588) and the Elwha Dam (FERC No. 2683)

Dear Ms. Cashell:

These comments are submitted on behalf of the Puyallup Tribe of Indians with regard to the Draft Environmental Impact Statement (DEIS) for the Glines Canyon and Elwha Dams. The decision now before the Federal Energy Regulatory Commission is a central concern to Indian peoples in the Pacific Northwest and presents the Commission with a unique opportunity to restore damaged natural resources and fulfill its trust obligation to Indian Tribes.

I. BACKGROUND

The Puyallup Tribe of Indians resides on its tribal reservation in Tacoma, Washington, and owns an eight (8) mile portion of the Puyallup River, which runs generally northwest to the Puget Sound. A hydroelectric project similar to the Elwha project, called the Electron dam, is located just upstream from the Tribe's portion of the river. Like the Elwha dam, the Electron dam is a pre-Federal Power Act project, which has never been licensed by the federal government. The Electron dam has caused numerous adverse impacts upon tribal natural resources, and therefore, upon the Tribe's spiritual and cultural well-being.

The action before the Commission is whether to issue or deny licenses for the continued operation of the two

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COMMENTS OF PUYALLUP TRIBE

existing hydroelectric projects on the Elwha River on the Olympic Peninsula of the State of Washington. The Commission is considering the following four alternatives: (1) retaining both projects with modifications for increased power generation and fish passage; (2) removal of the Elwha project and retention of the Glines Canyon project; (3) removal of the Glines Canyon project and retention of the Elwha project; and (4) removal of both projects.

PT-1 The Puyallup Tribe of Indians supports the removal of both projects as being the alternative that best serves the public interest in general, and Indian interests specifically. The Tribe supports the concerns raised by the Kallam Tribe with regard to the action now before the Commission. The Tribe also urges the Commission to recognize the value of our natural resources and establish a favorable precedent for all citizens of the Pacific Northwest.

II. COMMENTS

PT-2 Construction and continued operation of the Glines Canyon and Elwha dams (the dams) has both beneficial and adverse impacts. One the one hand, the dams provide discount cost power for a private entity, the Daishowa America Mill in Port Angeles, which arguably may indirectly benefits the public interest by providing employment for the Port Angeles area and freeing regional electrical power supplies for other users. On the other hand, the dams have in the past and continue to impact directly and dramatically the public interest by causing severe environmental and socio-cultural impacts in the region.

PT-3 Like the Electron Dam on the Puyallup River, the dams on the Elwha River have decimated at least ten previously viable fisheries. The dams have also inundated hundreds of acres of wildlife habitat. The dams have caused severe and unnatural erosion in the lower portions of the river, and limited the natural transportation of important sediments to downstream areas. PT-4 Additionally, the dams cause unnatural fluctuations in river levels and temperatures, which adversely impacts aquatic life and endangers human uses of the river.

PT-5 Beyond these specific adverse impacts on the general public interest, the dams have disrupted the very fabric of Indian society and culture. The Kallam Tribe on the lower Elwha River has suffered both economically and culturally as a result of the lost fisheries. The cycle of salmon is the sole economic asset of the Tribe, as well as the center of the Tribe's culture and identity. The loss of the Tribe's fisheries has contributed in large part to problems of unemployment and poverty on the reservation. PT-6 Additionally, the sudden and unexpected releases of water from the Elwha dam

RESPONSES TO PUYALLUP TRIBE

PT-1: Support for removing both dams is noted.

PT-2: Comment noted.

PT-3: Comment noted.

PT-4: Comment noted.

PT-5: The impact on the fabric of Indian society and culture is noted.

PT-6: Comment noted.

PT-6 cont'd endanger the safety of Tribal members when they fish in the lower river.

PT-7 The Commissions' alternative of removing both dams would prevent many of these adverse impacts without creating new permanent adverse effects. As the DEIS notes, the chances of restoring nine of the ten fish species is good to excellent. The return of healthy fish populations would of course result in the return and propagation of bird and animal species which prey on salmon and trout. Draining the reservoirs would expose currently inundated acreage that could serve as valuable habitat. Water flows and temperatures, sediment dispersion, and riverside erosion would return to natural conditions if the dams are removed.

In addition, the removal alternative is in accord with the fiduciary obligation owed by the United States and this Commission to Indian tribes. Given the dams' past and continuing adverse impacts upon the Kallam Tribe, issuance of a license for the dams by this Commission would be in derogation of its obligation to act in the Tribe's best interests. The restoration of salmon runs on the Elwha River would help preserve the spiritual and cultural wellness of the Tribe, and the Commission should give the removal alternative special consideration on this ground alone.

PT-8 Against the benefits to the public interest and the performance of the Commission's trust obligations to the Tribe, the DEIS balances the economic costs of removal to the applicant, James River II and to the dams' consumer, the Daishowa America Mill. The DEIS concludes that the applicant's proposal, retention of both dams with modifications, is by far the cheapest alternative. This is true, however, only because the Commission uses as an element of the cost streams "the value of power generation forgone." This element is biased in favor of retaining the dams because it does not consider the increase in power costs under the applicant's proposal.

PT-9 The DEIS indicates that the applicant's proposal would result in a doubling of the cost of the power generated by the dams. The DEIS concludes that this increased cost would be comparable to the costs of purchasing power from BPA in Port Angeles under the removal alternative. Yet, the DEIS finds the removal alternative many times more expensive than retention because of the loss of power generation from the river. Thus, removal costs are overstated in comparison to retention because the removal analysis adds the costs of purchasing replacement power, but the retention analysis ignores the increased costs of power generation on the river under the applicant's proposal.

PT-7: Comment noted.

PT-8: The staff believes the cost of replacing foregone power is a legitimate and definable cost of dam removal. Comparable treatment has been afforded all alternatives in determining relative dollar costs of the alternative actions.

PT-9: The removal alternative is found to be more costly than the applicant's proposal because of the net cost impact of construction, mitigation, operation and maintenance, periodic repair and replacements, and replacement power.

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III. CONCLUSION

PT-10 The Puyallup Tribe of Indians urges the Commission to support the removal of both the Glines Canyon dam and the Elwha dam. The public interest favors removal, and outweighs the costs to be borne by James River II and the Daishowa America Mill. This alternative offers the Commission a unique opportunity to undo some of the past wrongs against the natural resources of Native Americans and the citizens of the State of Washington. Further, by its selection of this alternative, the Commission may act in concert with its trust obligations to Indian Tribes.

We respectfully request that you consider these comments carefully in deciding which actions to take. Please contact the undersigned if you have any questions.

Very truly yours,

Richard A. Du Bey
James M. Grijalva
Special Environmental Counsel

JMG:mr
cc: Mr. Henry John, Chairman
Members of the Tribal Council
Mr. Joe Anderson, Fisheries Department
Mr. John Bell, Esq.

PT-10: Position in favor of dam removal is noted.

COMMENTS OF STATE OF WASHINGTON

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

June 26, 1991

Ms. Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, DC 20426

Dear Ms. Cashell:

The following comments on the Glines Canyon and Elwah Hydroelectric Projects Draft Environmental Impact Statement are submitted on behalf of the State of Washington. The Department of Ecology has been given the authority under a Governor's Executive Order to respond directly to federal agencies on behalf of the State of Washington. After review, consultation and input by all of our cabinet level agencies, and in cooperation with the Department of Natural Resources, these comments reflect our consolidated view.

SOW-1 The staff of the Federal Energy Regulatory Commission are commended for the preparation of the draft environmental impact statement (DEIS) document. In general the DEIS is comprehensive, well organized, and covers a broad spectrum of issues. It presents a fairly objective view of the alternatives. We believe the final EIS would be strengthened if it included a preferred alternative from those which have been evaluated. In general, a supplemental DEIS should be prepared to address the issues and deficiencies detailed in this letter and the detailed comments appended to this letter from each one of the state agencies. It is also important to include an analysis of a no-action alternative in the supplemental DEIS. The following is a summary of some of the issues the State of Washington believes need further evaluation.

SOW-2 There is a need to analyze the environmental impacts due to power replacement should the dams be removed. Replacement requires that power be generated elsewhere and that power generation will result in some environmental impacts. These should be quantified. With respect to the State of Washington's federally approved water quality standards, we question whether any alternative will meet our standards. An analysis of the standards in relationship to all alternatives is needed.

RESPONSES TO STATE OF WASHINGTON

SOW-1: The FEIS includes a preferred alternative. The staff concludes there is no reason to prepare a supplemental DEIS; comments have been addressed in the FEIS. EIS Section 1.3 explains that the scoping process did not identify any reasonable no-action alternative.

SOW-2: Section 4.5.1 has been expanded and updated to include additional quantification of potential adverse impacts from replacement power. Additional discussion of water quality standards has been added to Section 4.0.

COMMENTS OF STATE OF WASHINGTON

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SOW-3 Under the Dam Removal scenario the issue of flooding in the lower Elwha needs to be addressed. The adequacy of the existing flood protection structures and potential impacts need to be quantified.

SOW-4 A discussion of the sediment issues needs to be expanded in a number of areas for the dam removal alternatives. Sediment removal options to an upland site and specific measures to stabilize newly exposed sediment which is not removed should be explored. We have major concerns about the fate and effect of the sediments that would wash through subsequent to dam removal. Of particular concern are water quality and quantity of the water supply for industrial and municipal use, and with fish production issues in the lower Elwha. Additionally, the biological effects of sediments on the marine environment are not discussed.

SOW-5 For the dam removal alternatives, the disposal of solid waste from the dams should be specified. The concrete rubble from these structures may be of beneficial use in either riprapping or some other type of reuse.

SOW-6 The environmental impact statement should provide a discussion of the short-term impacts in relationship to the long-term benefits of restoring the fish runs. A specific discussion about the dam removal impacts on the existing resident fish population should be discussed.

SOW-7 The other category of major concern to the State of Washington is the lack of analysis of costs and local community impacts. It is extremely important that a fair analysis of the local impacts be described for each alternative. Of particular concern are impacts on the Daishowa America's paper mill. The economic viability of the mill is important not only from a social standpoint, but from an environmental standpoint as well. The company is building a large recycling facility as well as utilizing wood fiber from the commercial forest thinning program on state lands in the Olympic Peninsula. Such things as an alternative water supply for the City of Port Angeles must be engineered ahead of time.

SOW-8 Further, it is important that any alternative recognize the secondary impacts to the operation of the Daishowa Mill. In particular, the environmental assessment should present the results of the industrial, electrical audit which is underway at the mill for power conservation.

RESPONSES TO STATE OF WASHINGTON

SOW-3: The dam removal alternatives and associated cost estimates have been expanded to include mitigation measures for the increased flood potential. The causes of increased flood potential are the loss of peak flow attenuation in project reservoirs and the potential for downstream sediment accumulation in the river thereby raisin the riverbed elevation. An evaluation of peak flow attenuation in project reservoi showed only minor and limited attenuation potential. Peak flow attenuation would occur only for non-flood frequent storms. For the less frequent but larger storms, negligible attenuation is provided by the reservoirs. Diminished river capacity du to sediment accumulation would be of greater significance. It was determined tha flood flows would be approximately 1 foot higher along the flood protection levee with the estimated sediment accumulation (Section 4.2.1.2). The mitigation measures and associated costs now include raising and armoring the levee (Sectio 4.2.1.3). These measures would thus result in providing the same level of flood protection as currently exist.

SOW-4: Effects of high sediment loads and turbidity values have been addressed in more detail in Sections 4.2.1.1 and 4.2.2.1. The revised document describes modified mitigation measures to minimize impacts of sediment on the quality of water diverted for industrial and municipal use. Costs of these proposed mitigation measures are included in the revised EIS. An additional discussion of sediment effects on the marine environment have been added to Section 4.2.3.1.

SOW-5: The disposition of concrete rubble is now addressed in Section 4.2.1.1.

SOW-6: The EIS addressed these issues in Sections 4.2.8.1 and 4.2.8.2. Impacts to trout are discussed in Sections 4.2.3.1 and 4.2.3.2.

SOW-7: Section 2.7 has been revised to include Daishowa America's recycling facility. Staff feels that the DEIS adequately acknowledges that an adverse effect on the mi could adversely affect the whole local economy, but data are not sufficient to determine what Daishowa America's response would be to an increased power cos and how many (if any) jobs would be affected. Mitigation to control the adverse effects of dam removal on the City of Port Angeles water supply is now included the dam removal alternative (see Section 4.2.2.3).

SOW-8: The results of the audit have been included in Section 2.7.3.

Ms. Lois Cashell
June 26, 1991
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There are numerous economic issues discussed in the attached specific comments from the state agencies. These range from a lack of a discussion regarding who is going to pay for dam removal impacts to the assumptions made for the cost and methodology for replacement power at the mill. A further discussion of these issues is needed in a supplemental DEIS.

In summary, we believe more information is needed and additional analysis is necessary before any decisions can be made about the alternatives mentioned in the EIS. We are willing to assist your efforts by providing you with additional specific information, so please contact us if we can help.

Sincerely,

Christine Gregoire

Christine O. Gregoire
Director

Attachments

STAFF REPORT

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

June 27, 1991

TO: Mike Palko, Supervisor
Environmental Review Section

FROM: Rod Sakrison, Hydropower Coordinator *Rod Sakrison*
Water Resources Program

RE: Ecology's Comments on Elwha Dams Draft EIS

Upon receipt of the draft Environmental Impact Statement for the Elwha/Glines Canyon Hydroelectric Projects, comments were solicited from interested programs within the Department of Ecology. The Water Resources Program consolidated the comments into a single document, which you have included in the comments to be submitted to the Federal Energy Regulatory Commission by the State of Washington.

In addition to our own comments, the Water Resources Program incorporated the internal review of the draft EIS from the Shorelands Program, Water Quality Program (Southwest Regional Office), Water Resources Program (Southwest Regional Office), and the Solid and Hazardous Waste Program (Southwest Regional Office).

RS:dh

cc: Hedia Adelsman

COMMENTS OF STATE OF WASHINGTON

Comments of the Department of Ecology on the
Draft Environmental Impact Statement for Glines Canyon, FERC No. 588
and Elwha, FERC No. 2683, Hydroelectric Projects, Washington.

GENERAL COMMENTS

The staff of the Federal Energy Regulatory Commission are to be commended for the preparation of the draft environmental impact statement document. The NEPA scoping process has been successfully used to identify a range of alternatives and impacts that could arise. The draft environmental impact statement is a very comprehensive document that addresses the impacts of both the developmental and non-developmental uses of the Elwha River.

SOW-9 We believe that the final EIS would be strengthened if it included a preferred alternative from among those that have been evaluated. In that regard, the draft EIS appears to support the identification of dam removal over the other licensing alternatives as having the greatest chance of meeting the environmental resource objectives, although at the loss of the renewable hydroelectric energy. Based on the near parity between the alternatives for the cost-of-power to the Diashowa Mill, the environmental resource objectives should drive the future licensing decisions.

SOW-10 Please include a table in the beginning of the document which shows all the resource permits and approvals that will have to be obtained for all alternatives.

Our technical review of the environmental impacts has been limited by the general lack of supporting evidence contained in the DEIS. Our detailed comments are related to those portions of the document that are not well justified based on the data presented, or which will require additional explanation and evaluation in the final environmental impact statement.

TECHNICAL COMMENTS

Executive Summary

SOW-11 p. xxxv "... the applicant's proposal would provide about 168GWh of electrical energy..." Is this an annual energy figure?

SOW-12 p. xxxv "...with an additional 2 to 5 years identified for complete sediment stabilization." The middle of the next page says that 6 to 10 years after construction, the river would be unstable. Which statement is correct?

SOW-13 p. xxxvii, The capital cost of removing the dams (not including the value of lost power) is not included in future energy cost calculations. The assumption that dam removal costs will not be passed on to the mill is

RESPONSES TO STATE OF WASHINGTON

SOW-9: The FEIS includes a preferred alternative. The suggestion that the environmental resource objectives should drive the decision is noted, but FERC is required to give equal consideration to developmental and nondevelopment values.

SOW-10: A complete list of necessary permits and approvals can be found in James River's December 1, 1989 response to the staff's August 15, 1989 request for additional information (James River II, 1989). Staff does not feel that this list needs to be included in the EIS.

SOW-11: Yes, it is average annual energy.

SOW-12: The text in the Executive Summary has been revised to state that it will take 4 to 6 years for the disturbed areas to stabilize. In northwest Washington, it typically takes 4 to 6 years for construction sites, landslides, clearcuts, and other disturbed areas to establish relatively strong stands of vegetation. As the vegetation in the reservoir areas and the new river channel bars and banks develop, the supply of sediment delivered downstream from the reservoirs would gradually decline to levels comparable to other natural sediment sources in the watershed.

SOW-13: If the mill were to bear the full cost of dam removal and that cost were to be applied to the mill's power costs, the mill's cost of power would be an additional $125 million over that projected in Table 2-20.

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COMMENTS OF STATE OF WASHINGTON

SOW-13 cont'd — made at p. 2-40. What would be the cost of power impacts if this assumption is not made, and the dam removal costs were attributed to the project applicant?

SOW-14 — p. xxxviii — Why are the resource objectives described as being mutually exclusive? It should be noted that three of the four alternatives presented in the EIS do address to some degree all three of the primary objectives.

1.0 Purpose and Need For Action

SOW-15 — p. 1-4 — A "no-action" alternative should not have been dismissed by FERC staff as inappropriate, even though all parties may have advocated that some action must be taken. The purpose of a "no action" alternative is to provide a base from which action alternatives can be measured and compared. This decision should be reconsidered. Compliance with NEPA appears to require that a "no action" choice be defined and assessed. Regulations issued on November 29, 1979 by the Council on Environmental Quality for implementing the provisions of the National Environmental Policy Act requires a "no action" alternative (paragraph 1502.14 (d)).

2.0 Proposed Action and Alternatives

SOW-16 — p. 2-11 — While considerable efforts have been made toward achieving an effective low or no loss passage facility for out-migrating salmonids, the current state-of-the-art does not lend to great confidence that this objective can be achieved, especially for passage facilities associated with hydropower projects.

SOW-17 — p. 2-14 — The protection of fisheries in the lower river, should the applicant be permitted to use reservoir storage to augment low river flows on an as-needed basis, is a very important consideration. The effect of eliminating the capability to augment low flows in the lower river, either through dam removal or operational constraints should be addressed. What mitigative measures might be proposed to replace the flow augmentation capacity of Glines Canyon?

SOW-18 — p. 2-17 — "[i]n light of the presently available knowledge of geologic and sediment conditions within the reservoirs"...it may be prudent to prepare a supplemental environmental impact statement solely on dam removal, should it be selected by the FERC Commission as the Elwha licensing decision.

RESPONSES TO STATE OF WASHINGTON

SOW-14: The text has been revised to delete the reference to mutual exclusivity.

SOW-15: The "no-action" alternative's purpose, i.e., providing a base from which action alternatives can be measured and compared, has been fulfilled. The baseline for comparison used in the EIS is the current environment. All alternatives are compared with reference to changes from the baseline. The scoping process failed to identify any reasonable no-action alternative. Not acting on the pending license application is not an option available to FERC. Denying licenses is, effectively, the dam removal alternative.

SOW-16: Some modifications to the applicant's proposal have been made to improve passage (see Section 4.2.3.3).

SOW-17: Low-flow augmentation with the dams in place has been retained in the applicant's proposal. No additional measures are proposed to augment these flows if dams are removed primarily because: (1) they would be needed less because temperatures would be cooler; (2) disease problems are likely to be lessened; (3) less fish will be in the lower river because of access to the upper river; and (4) any substantial increased flow (i.e., Ranney wells) would be very expensive to develop for the whole lower river.

SOW-18: Comment noted. If the Commission selects dam removal as its action, additional engineering studies will be required to refine the construction plan prior to removal.

COMMENTS OF STATE OF WASHINGTON

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SOW-19 | p. 2-18 | The next to final stage of dam removal at the Elwha dam, under the staff's approach, would be to physically remove the 60-foot-deep sediment accumulation upstream of the small coffer dam used to divert flow into the diversion tunnel. The quality characteristics of these sediments, handling procedures and impact, and ultimate place of disposal must be thoroughly discussed in the final impact statement.

SOW-20 | p. 2-19 | During the lowering of Lake Mills, the use of the Glines Canyon Dam penstock under open channel flow conditions needs to be considered carefully.

SOW-21 | p. 2-20 | The silts in and adjacent to the scour channel, which would "be allowed to sluff into the scour channel and to be carried downstream out of the reservoir" are a concern from a state water quality management perspective and for local water supply impacts. FERC staff has assured that almost all silts will completely vacate the river system. Nonetheless, it is Ecology's policy that all efforts shall be taken to minimize the amount of fines or silt that are allowed to moved out of Lake Mills by hydraulic means. The final EIS should further evaluate the proposed channel cutting process.

SOW-22 | p. 2-29 | The analysis of energy contribution from the projects to the Diashowa mill should be reevaluate with a less likely plant expansion scenario, but including the deinking facility that is currently under construction.

SOW-23 | p. 2-29 | Since later in the economic analysis the focus of the evaluation of the alternatives is on the cost-of-power basis, it is not relevant to combine capital and energy-generation foregone costs as a means of comparing the alternatives.

SOW-24 | p. 2-29 | Under the Northwest Power Planning Council's methodology for incorporating environmental costs (and benefits) into the preference for energy alternatives, these not-easily-quantified factors are included if they would change the order of selecting otherwise equally cost-effective resources. In the case of the Elwha, the economic values (cost-of-power) are so close between dam removal and the applicant's proposal that the concurrent assessment of nondevelopmental values of fish production, recreation use, terrestrial resources, aesthetics is required and conclusive.

SOW-25 | p. 2-40 | The similarity between overall power costs to the mill (39 mills/kWh) of the applicant's proposal and dam removal is

RESPONSES TO STATE OF WASHINGTON

SOW-19: The sediment accumulation described is located just downstream from the cofferdam location and extends to the face of the dam. Much of this material is the same throughout the reservoir with the inclusion, however, of a greater proportion of gravel, boulders, and organic matter in the immediate vicinity of the dam. Handling procedures would be essentially identical to those used upstream. Disposal would also be similar except that, because of proximity, excavated material would likely be used as fill on the topographic knob in the area of the north spillway location. See Appendix A for more detail.

SOW-20: Comment noted. The penstock releases would be controlled to prevent full free-flow conditions.

SOW-21: The erosion or dredging and transport of lake bottom silts and clays must occur to restore the original channel. Two general approaches were considered: (1) the erosion or scour and flushing of the channel sediment with controlled drawdown; and (2) the hydraulic dredging of the sediment behind storage berms. Estimated impacts of the flushing option are presented in the FEIS. Hydraulic dredging of the lake sediments behind the berms would reduce the amount and duration of fine sediment moving downstream; however, the work would be difficult to perform and there would still be significant concentrations of sediment flushing downstream. The hydraulic dredging would need to be accomplished beyond the erosion zone (in 20 to 30 feet of water) as the reservoir is lowered. Pumped sediment would be transferred about 1,000 feet upstream to exposed portions of the reservoir. Retention berms could be built with the sandy delta sediments trucked down to the reservoir. Most of the berms would need to be built on top of the inplace silts which could create some problems. To hold all the channel silts would require some very large storage cells to accommodate the sediment and the large quantities of water that hydraulic pumping uses. The cost estimates for sediment management included in the FEIS allow for hydraulic dredging of the channel area silts, but only by pumping them to the side of the reservoir where a portion would settle out and most would remain suspended and flush downstream. The staff chose to include costs to cover hydraulic dredging of the sediment, but based the impacts assessment on the channel silts and clay flushing downstream to bracket the analysis at the conservative side of sediment impacts. See Section 4 and Appendix A for details.

Silt and clay would be fully suspended in the Elwha River. It would deposit in the channel's low velocity zones such as the edges of the channel, among the large bed elements, in the pools, and in overbank areas during higher flows. Conditions would be similar to glacial streams in the summer melt season. Once the sediment supply of silt and clay is flushed or removed from the channel areas, the material that is draped over the low velocity areas would be washed downstream in the first flood flows, similar to glacial streams in the late fall or winter.

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SOW-22: The FEIS incorporates consideration of the recycling project.

SOW-23: The focus of the cost analysis (Section 2.7.2) is on the combination of capital, O&M, and replacement power costs. A cost of power analysis (Section 2.7.3) is also provided.

SOW-24: As stated in revised Section 2.7.2, the cost analysis is limited in its scope, and the cost comparison must be considered in conjunction with the full range of environmental effects described in the EIS.

SOW-25: The cost of power analysis has been updated. Reference Section 2.7.3.

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SOW-25 cont'd

acknowledged. This eliminates cost of power as a decision criterion for these two alternatives. This is important, since these two alternatives are the most effective, each in their own respective ways, in achieving resource objectives.

3.0 Affected Environment

SOW-26

p. 3-10 The description of the current river morphology and sedimentation depicts a river that would naturally produce considerable bedload material and suspended sediment, that would be transported throughout the entire river were it not for the existing dams.

SOW-27

p. 3-14 In the middle section of the river, a coarser surface pavement with reduced sand and gravel in the sub-pavement has resulted when compared to natural conditions. This is attributable to the Glines Canyon dam.

SOW-28

p. 3-18 The setback levee discussed in second sentence is probably the Corps-built levee which is on the east side, not west, of the channel. However, it is true that there is a short jetty on the west side at the mouth.

If any of the alternatives do cause a water surface rise that requires raising of the 1989 levee built by the Corps, then remedial work of raising the levee and providing original project protection should be included. The entity responsible for dam removal may be the one that must pay for the levee modification.

SOW-29

pp. 3-20, 3-21 Where are the discharge records measured? What is the period of record? What is the probable maximum flood estimated for dam safety purposes?

The low flow measurements and records discussed in the DEIS for the Elwha were probably taken at the USGS gage station at McDonald Bridge which does not take into account the addition of water from the Little River and Indian Creek. There are some flow records for the Little River but not Indian Creek, however, they both have similar sized drainage. A comparison of river flows shows that when the Elwha drops to 197 cfs the Little River would have about 4 cfs. Because Indian Creek, which drains Lake Sutherland, has a similar sized drainage, you can expect an additional 8 cfs in the Elwha below Lake Aldwell.

SOW-30

p. 3-23 The City of Port Angeles' Ranney well collector system is located several 1/10ths of a mile away from the intake to

SOW-26: The reviewer's statement correctly identified that the staff's conclusions are based on the measured volume of sediment stored in the reservoirs and the estimated amount that flushed through the reservoirs.

SOW-27: Comment noted.

SOW-28: The text has been changed in Section 3.2.1.2.

SOW-29: The low-flow measurements for the lower section of the river are based upon the USGS gage at McDonald Bridge, but have been modified to account for tributary inflow and groundwater accretion. Estimates of increased discharge are based on increases in drainage area from the McDonald Bridge gage to the lower section of the Elwha River. These increases in flow as a function of drainage area were also incorporated into the water temperature model developed by the staff to predict longitudinal changes in temperature under the dam removal alternatives. Estimates of flow accretion during the low-flow period are slightly higher than the additional 8 cfs cited from Little River and Indian Creek.

SOW-30: Section 3.3.2 has been changed to incorporate this information.

SOW-30 cont'd

the state rearing channel. It is physically proximate to the fish attraction channel at the lower end of the rearing channel facility.

SOW-31

p. 3-23 The DEIS states that existing water rights on the Elwha River total 206 cfs. Actual water right use at this time is less. The City of Port Angeles active permit for the Ranney collector has not yet been perfected. At the present time the City can take only 17 cfs maximum from the collector.

The permit is for 13,500 gpm primary and 9000 gpm supplemental which translates to 30 cfs and 20 cfs respectively. The significance of the primary and supplemental diversion is that the City can not take more than 50 cfs total from all source combined or they can take 50 cfs total from just this diversion. The City will likely use some water from other sources, reducing the total amount of water taken from the Ranney collector.

Maximum water usage by ITT is presently around 74 cfs. Maximum water usage by Diashowa is presently around 18 cfs. The total industrial withdrawal is around 92 cfs. The maximum amount of water allowed under this certificate is 100 cfs. Some savings beyond this may occur with leak detection and conservation measures.

Clallam County PUD No. 1 has a well near the Elwha River capable of withdrawing 2250 gpm which is equal to 5 cfs.

Irrigation rights total 1.4 cfs.

Fish propagation rights total 51.26 cfs which includes the WDF rearing channel and other rights upstream.

Single and multiple domestic water rights on the river system total 3.56 cfs.

The total water use on the river system at this time should not exceed 170.22 cfs to 178.22 cfs, allowing for flexibility in the industrial diversion figures.

SOW-32

p. 3-24 The DEIS reports that "Increased water temperatures also occur in the middle and lower reaches of the Elwha River in late summer and early fall due to storage of heat in Lake Mills and Lake Aldwell. The data provided indicates violations of the State Water Quality Standards (Chapter 173-201 WAC). This evidence may be sufficient to preclude the issuance of a water quality certification, under Section

SOW-31: The existing water right of 206 cfs on the Elwha River was obtained from a recent EIS prepared by the Washington Department of Ecology. To the best of staff's knowledge, this water right is currently correct because it has not been refuted in your comment. The staff recognizes that total water use on the river is less than the existing water right and appreciates the additional information on current estimated water uses in the river. However, the Washington Department of Ecology's EIS for the Daishowa Pulp Mill indicates that demand for water in the Elwha River is increasing. Consequently, the staff addressed the 206-cfs value as the total flow, which would potentially be diverted from the river in the future.

SOW-32: Comment noted. Sections 4.2.2.1 and 4.2.2.2 have been revised to further evaluate the effects of the alternatives on state water quality standards.

SOW-32 cont'd

401 of the Federal Clean Water Act, for the applicant's proposal, that would retain the dams. Releases of colder waters from Lake Mills may have been effective in past years to mitigate elevated temperatures in the lower river, but not without causing dissolved oxygen impacts below the Glines powerhouse outfall. The final EIS should further evaluate the water quality effects of the alternatives in relation to state water quality standards.

SOW-33

p. 3-24 The last three sentences of the last full paragraph appear contradictory. If warming of the lower river is insignificant but contributes to infestations of Dermocystidium, then mortalities of chinook salmon due to the parasite are insignificant. It is unlikely that this is the intended meaning of this section of the DEIS.

SOW-34

p. 3-79 - 3-81 The Shoreline Management Act, as implemented by local government via their approved Shoreline Master Programs, is a substantive element of Washington's federally approved Coastal Zone Management Program (CZMP). Thus, compliance with the shoreline permitting requirements of applicable local jurisdiction is a requirement of coastal consistency. While the drafters of the DIES briefly address the issue of the consistency of the alternatives with the Clallam County Shorelines Master Program, and that this master program is an important part of the CZMP, the Department of Ecology has the following major reservations:

- The conclusion reached regarding consistency of the alternatives with the Clallam County Shorelines Master Program is opposite of the conclusion the Department of Ecology reaches in the analysis of the same question; and

- The discussion of consistency regarding the alternatives relative to the Clallam County Shorelines Master Program does not suffice to meet the requirements of the CZMA as a submission of a Coastal Consistency Certification and should not be relied upon by the James River Corporation a s federal license applicant in meeting this obligation.

The most accurate means by which an evaluation of the consistency of the proposed project can be made is by considering the requirements of the Clallam County Shoreline Master Program; early application for shoreline permits is the most appropriate and expeditious manner for preparing and accurate coastal consistency certification.

SOW-33: The EIS currently states that the lower river warms by 2 to 4°C from summer heat loading in Lake Aldwell and Lake Mills. This warming is significant and may contribute to *Dermocystidium*-related mortalities in chinook salmon during the early fall. However, a direct relationship between *Dermocystidium* mortality and water temperature has not been identified in studies conducted in the Elwha River.

SOW-34: Comment noted concerning the reservations of the staff of the Department of Ecology.

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SOW-35 p. 3-95 A statement on this page says that Lake Aldwell varies about 5 feet a year. A statement on p. 2-8 says the lake is held within one foot. Which statement is correct?

SOW-36 p. 3-97 A statement on this page says that Lake Mills pool elevation varies little in elevation. A statement on pg. 2-5 says that reservoir drawdown can be 10 feet. Which statement is correct?

4.0 Environmental Impacts

SOW-37 In General The DEIS does not adequately discuss impacts of dam removal on flood control along the Elwha River. Discussions on flood control impacts from dam removal are scattered in several subsections of Chapter 4. These discussions should be consolidated and given more emphasis in the DEIS because the Elwha River flooding problem is significant. Within this new flooding impacts subsection, both of the following potential problems should be discussed:

- Increased sediment load in the river from dam removal will affect the protection level provided by downstream levees; and

- to a very minor extent, dam removal will also increase downstream discharges due to removal of the modest alternating effects of reservoir storage.

SOW-38 p. 4-3 There needs to be a better explanation of the temperature effects associated with fish passage spills at Glines Canyon Dam and "flow augmentation requested by state agencies and tribes during low-flow conditions." If the augmentation flows are provided from the surface of Lake Mills, or are spilled to provide fish passage, elevated temperatures in the middle and lower rivers result. Flow augmentation via power generation at Glines Canyon does not contribute to fish passage. Additional discussion of these tradeoffs and impacts should be included in the FEIS.

SOW-39 p. 4-4 The State Water Pollution Act (Chapter 90.48 RCW) prohibits any impacts caused by concrete wastes, and runoff or spilling of fuels and lubricants from heavy machinery used during construction.

SOW-40 p. 4-5 Is the applicant's proposal for flow augmentation accomplished through power generation or surface spill? If the flows are provided through the power intake, will provision of these proposed augmentation flows impact the

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SOW-35: Historically, the lake level has fluctuated as much as 5 feet per year. However, since 1983 changes in pool elevation have been held to within 1 foot. The text has been modified to clarify pool elevation.

SOW-36: Historically, the lake level has fluctuated as much as 10 feet in a year. Currently, it fluctuates very little.

SOW-37: Refer to response SOW-3.

SOW-38: To satisfy flow augmentation requests by state agencies and tribes during extreme low-flow periods in late summer and early fall, additional flows would be obtained via power generation. Additional flows obtained by lower lake elevations would not result from spilling Glines Canyon dam. Consequently, flow augmentation would not significantly modify water quality conditions existing under current operation during this same time. Increase in water temperatures would not be expected to result from augmentation flows because these flows would not be derived from the spill of warmer surface waters.

SOW-39: Comment noted.

SOW-40: As described in SOW-38, additional power generation, not from a surface spill, would cause flow augmentation. Drafting of Lake Mills for flow augmentation would be limited to a 10-foot reduction in reservoir elevation under the applicant's proposal. This reduction in water surface elevation would not be expected to affect the fish passage spill program proposed under the applicant's proposal.

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SOW-40 cont'd

ability to provide fish passage spill of at least 175 cfs (possibly as high as 400 cfs)?

SOW-41

p. 4-5 The DEIS assumes that total water diversion 205 cfs. Our earlier comment noted that actual water use in somewhat less (172 - 178 cfs) than the total water rights issued to date. In addition, the WDF rearing channel, when in operation, is non-consumptive to the Elwha basin in that the 50 cfs diverted is returned to the river, although downstream from the point of diversion.

The length of this bypass reach is identified in the DEIS as 0.2 miles. This is the portion of the river most vulnerable to low flows. When the WDF rearing channel is not in use, are the diverted waters returned to the Elwha River somewhat closer to the City's diversion dam. What is the length of this shorter bypassed reach?

Do the low flow conditions in the lower river create impassable barriers for migrating salmon? Are there available mitigation measures, other than flow augmentation from stored waters, to lessen the impact of low flows on the fisheries resource?

We estimated tributary inflow to be much less than the FERC staff (8 v. 30 cfs).

SOW-42

p. 4-6 The proposed summer fish passage spill (100 cfs) "would not have a significant effect on flow during the remainder of the year, since the spill volume would contribute relatively little to total river discharge." Why is this true? Is it because of the timing of the spills, which precede the critical low flow period?

What effect does fish passage spill have on low flow augmentation? Can you have both? Does spill exhaust the 10 feet of active storage available too early to contribute to critical low flows in the lower river?

SOW-43

p. 4-7 It is noted that fish passage spill releases would occur at night and would not violate state water quality standards in the middle river, even during the extremely warm days in low-flow periods.

SOW-44

p. 4-7 The EIS should address downstream temperature increases resulting from spills greater than 100 cfs a Glines, because higher spills may be needed to safely and effectively pass migrants. A 175 cfs minimum spill has been used for passage

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SOW-41: When the WDF rearing channel is not in use, water is diverted at the City's diversion dam for industrial uses. Drinking water is obtained from Ranney collectors approximately 60 feet below the riverbed located close to the lower end of the WDF rearing channel. Consequently, the staff assumes that no diverted water is returned to the river downstream of the City's diversion dam when the WDF rearing channel is not operating.

There have been no reports presented to the staff indicating that natural low flow with existing diversion inhibits fish passage. Surveys from 1986 to 1989 showed substantial numbers of chinook spawning above the water diversion during this period, including low-flow years. Whether the fish ascended to this region before, during, or after the lowest-flow period is unknown, but it appears that migration was sufficient for spawning to occur in this area. However, additional flow was released from the dams during some low-flow periods, which may have influenced this access. Theoretically, flow could reach levels where water rights could exceed stream flow which would not only affect passage but lower river survival and spawning. Currently, the staff knows of no way to limit this potential problem other than with reservoir releases, unless water rights restriction can be implemented.

The 8-cfs tributary inflow value cited earlier in the WDOE's comments is based on discharges provided by two streams: Little River and Indian Creek. Analysis of the lower Elwha River drainage by staff hydrologists indicates that additional flows and groundwater accretion would be provided to a number of smaller tributaries; therefore, a 30-cfs inflow value would be more appropriate than the 8-cfs value estimated by WDOE.

SOW-42: Only flow augmentation measures proposed by the applicant would be expected to have a significant effects on flows in the middle and lower sections of the river. Because flow augmentation would only be implemented during extreme low-flow conditions during the late summer and early fall, flows in the river would not be affected by this measure during the rest of the year. Fish passage spills, which constitute a separate mitigation measure than flow augmentation, would not be expected to affect existing flow patterns in the middle and lower river because water used for fish passage spills would be subtracted from the total volume of water used for power generation at any given time. Consequently, spill would not expected to reduce the volume of water stored in Lake Mills, except during extremely low-flow conditions when spill requirements exceed reservoir inflows. In this situation, fish passage spills and river flows could be augmented by the 10 feet of storage provided by Lake Mills. However, once this storage is exhausted, fish passage spills and river flows would not be reduced to equal reservoir inflows.

SOW-43: Comment noted. The effects of proposed fish passage spills on water temperatures have been addressed in greater detail in Sections 4.1.2.2 and 4.1.2.3.

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SOW-44 cont'd — evaluations. The 175 cfs minimum spill should be modeled for temperature results.

SOW-45 — p. 4-7 — The paragraph at the bottom of the page regarding dissolved oxygen levels below the Glines Canyon powerhouse indicates conditions "considerably below the state criteria." Although this is a short section of the river (0.5 mile), state and federal laws prohibit the certification of a federal power license, under Section 401 of the Clean Water Act, if there is evidence that the license would cause violations of state water quality standards.

SOW-46 — p. 4-57 — As noted above, Ecology's shorelines staff disagrees with the statement that the applicant's proposal is consistent with the Clallam County Shorelines Master Program. In their opinion, restoration of the ecosystem would be more consistent with the master program and the mandate of the Shoreland Management Act for shorelines of statewide significance (greater than 1000 cfs mean annual flow).

SOW-47 — p. 4-74 — The dam removal alternative, if uncontrolled, could result in erosion of reservoir sediments which could result in a significant build-up of sands in the middle and low reaches of the Elwha. It is Ecology's policy that discharge of reservoir sediments must be minimized to maintain water quality and decrease the risk of flooding.

SOW-48 — p. 4-74 — If most of the loss of the sediment in the reservoirs would be in the form of sediment so fine that very little would settle in the Elwha River, what material is expected to cause downstream disposition, and what are its sources?

SOW-49 — p. 4-80 — The text says that terraced slopes would be designed against mass failure. Some discussion on what design criteria is to be used should be included. Sketches of the terrace design would help also. Thorough analysis will have to be done on the long-term stability of the terraces due to undercutting.

SOW-50 — p. 4-84 — Extensive geotechnical exploration would have to be done in designing the stability of the sediment.

SOW-51 — p. 4-83 — The flooding impact of dam removal on the Lower Elwha are noted as an additional 1 to 5 feet, with 2.5 average increase in flood levels for the 200 year flood. Flood protection would be reduced from 56,000 cfs to 30,000 cfs. The approximate levee improvement cost are expected to be $570,000. The DEIS does not identify a responsible party for these flood improvements necessitated by dam removal.

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SOW-44: Downstream temperature increases resulting from spills of 200 cfs, which is provided under the applicant's proposal with staff-recommended measures, have been modelled and addressed in Section 4.1.2.3.

SOW-45: Comment noted. Potential violations of state water quality criteria for dissolved oxygen concentrations have been further addressed in Section 4.1.2.2. Additional dissolved oxygen monitoring would be needed to define the actual length of stream channel affected by reduced oxygen levels, although this is not expected occur more than 0.5 mile below the Glines Canyon dam powerhouse due to the turbulent nature of water in the middle section of the river.

SOW-46: The staff found the applicant's proposal, to place a boat-in campground in a natural zone, to be substantially inconsistent with the Clallam County Shorelines Master Program. However, the staff could not determine that any other aspect of the proposal was inconsistent with the plan. The applicant's proposal would not change much of the existing shoreline use upon which the Shorelines Program adopted the various levels of protection.

SOW-47: Comment noted.

SOW-48: Silt and clay would deposit in low velocity zones such as among the large bed elements, in pools, and in channel edges during the reservoir lowering period of construction. Near the end of reservoir lowering, the retention time of the partial reservoir would be reduced until sand would no longer settle out. Sand deposited in the reservoir channel and from possible channel bank slumps would erode and be deposited downstream.

With return of the natural upstream sediment supply, channel bars would have deposits of sand and gravel similar to conditions upstream of the project. The channel substrate would have additional sand and gravel similar to upstream conditions. More sediment is being dumped (sediment supply) on the conveyor belt (river discharge) that is moving at the same rate so there would be more sediment stored in the channel and bank areas.

SOW-49: Cross-sections have been included in the FEIS. Final designs would include site-specific stability analysis. The staff analysis for assessment purposes included field measurements of the eroding delta slopes during the drawdown test, comparison to similar eroded deltas which are common in the region, soil tests on one lake bottom sample, stability analysis for saturated conditions of typical lake bottom, and delta sediment cross-sections by the staff.

SOW-50: Comment noted. See response SOW-49.

SOW-51: The dam removal alternative now includes a recommendation that the levees be raised as needed to accommodate the 200-year flood (Section 4.2.1.3). Section 4.2.8.2 now describes the increased flooding potential as an effect that would be mitigated. The entity charged with paying for dam removal would pay this cost as well.

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SOW-52 — p. 4-85: The DEIS identifies unavoidable adverse impacts to •fisheries spawning [sic] channel operations, the Port Angeles industrial water supply treatment systems and the lower Elwha set-back levee would be needed to meet present operating requirements. The final EIS must provide a complete analysis of the impacts to water supplies and flood control structures.

SOW-53 — p. 4-85: The DEIS identifies other water quality impacts of dam removal that are significant and beneficial. Water temperatures in the river would benefit from a lower of 2 to 4 degrees C during the summer low-flow period.

SOW-54 — p. 4-88: The DEIS identifies potential water quality violations from excessive turbidity levels during dam removal. These violations of state water quality standards will prohibit certification of the dam removal alternative under Section 401 of the Federal Clean Water Act if they are expected to persist indefinitely. Ecology's policy is that chronic violations of water quality standards will not be certified. Short-term modifications of water quality standards can be allowed for water quality conditions that are expected to be corrected in time.

SOW-55 — p. 4-88: Impacts and mitigation costs to the City of Port Angeles' municipal and industrial water supply system must be fully assessed in the final EIS. These costs should be added to the total costs of the alternatives and responsible parties identified.

SOW-56 — p. 4-89: With the dams removed, how will industry and the city be affected during the driest years?

SOW-57 — p. 4-91: The water quality monitoring measures identified by FERC are necessary to assure that dam removal is carried-out without environmentally damaging effects.

SOW-58 — p. 4-91: The DEIS expects that increased operation and maintenance costs to the City of Port Angeles' municipal water supply would be approximately $30,000 per year with an initial capital cost of approximately $100,000. This is on the order of 5-10% of the City's estimated costs. Which figures are correct? What are the correct figures for the ITT and Diashowa mills?

SOW-59 — p. 4-104: The adverse downstream temperature effects could occur to the lower river with dam removal. The DEIS states that the frequency of daily maximum daily water temperatures in the range of 16 to 20 degrees C will increase with dam removal.

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SOW-52: These analyses and discussions have been expanded and are included in the FEIS, Sections 4.2.1.3 and 4.2.2.3.

SOW-53: Comment noted. Predicted reductions in daily stream temperatures under the Glines Canyon dam removal alternative are described in greater detail in Section 4.2.2.2.

SOW-54: The department's policy is noted.

SOW-55: These impacts and mitigation costs have been assessed and the costs added to the respective alternative.

SOW-56: Lake Mills provides storage capacity, which could be used to augment the City's water supply during low-flow periods. This storage capacity was used to a limited extend in 1987 by the applicant to provide additional flows for fish in the lower section of the river at agency and tribal request. Removal of Glines Canyon dam would eliminate a potential source of storage during drought conditions. Consequently, water availability might not meet demand under extremely low-flow conditions (i.e., approximately 1-in-20-year drought). Because sediments resulting from dam removal would not be mobilized during extremely low flows, suspended sediment concentrations and associated turbidity values would be lowest during the driest years.

SOW-57: Comment noted. Revised Section 4.2.2.3 provides a better description of water quality monitoring proposed under the dam removal alternatives. This water quality program would be required to comply with State Department of Health monitoring requirements for potable water.

SOW-58: The increased O&M costs presented in Appendix A provided for additional costs of chlorination only. Chlorination would be required because of possible contamination to the City's drinking water supply by extremely fine, suspended sediments and dissolved organic matter. The City of Port Angeles' cost estimates probably reflect additional costs for filtration, pumping, and maintenance for water obtained from the City's Ranney collectors. Because of the depth in the streambed at which these water collection facilities are located and because of the natural filtration provided by sediments in the streambed, increases in sediment and organic matter concentrations are expected to be minimal. Thus, increased O&M costs estimated by the staff are lower than those provided by the City.

Discussion and capital cost estimates of additional Ranney collector facilities proposed by the staff to minimize water quality impacts to the industrial water supply are provided in Appendix A and Section 4.2.2.3.

SOW-59: Temperature changes are addressed in Section 4.2.2.2. Temperatures will be reduced, but this is less of a problem than currently occurs.

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SOW-59 cont'd — The derivation of these conclusions are not adequately documented in the DEIS.

SOW-60 — p. 4-109 — The loss of 42.7 acres of wetlands in reservoirs, and other affected wetlands, will most likely have to be mitigated on the basis of the significant of the wetland. Ecology's shorelands staff should be involved in the assessment of the significance of the wetlands.

SOW-61 — p. 4-127 — As noted above, Ecology's shorelands staff believes the dam removal alternative to more consistent with the overall goals and management objectives of the Shorelines Management Act.

SOW-62 — p. 4-136 — The statement is made that with removal of both dams, the threat of flooding would be slightly greater in the upper one-half mile of the Elwha levee. This contradicts previous statements concerning flood depths 2.5 feet greater during the 200-year flood and the need to make the levee 5 ft. higher.

SOW-63 — p. 4-136 — The duration of the impact to the City of Port Angeles's municipal water supply is very important. What considerations were addressed in determining that impacts might occur for "2 to 5 years?"

SOW-64 — p. 4-136 — The Ediz Hook paragraph mentions an annual cost of $100,000, but the other paragraphs on this page do not quantify. Why not add the other costs for overall consistency?

SOW-65 — p. 4-136 — In general, the draft EIS overestimates the importance that the restoration of the Elwha River bedload would have in reducing beach nourishment requirements discussions of Ediz Hook. In most cases, the EIS states that restoration of the bedload would reduce nourishment requirements, which would be true to a degree, but later the EIS goes so far as to say..."Eventually, beach nourishment of the Ediz Hook area would no longer be needed." Even if removal of the waterline bluff protection works (a potentially much more important source) were to take place, we believe artificial nourishment of Ediz Hook would still be required.

Restoration of Elwha bedload would affect the near proximity of Angeles Point the most, helping a great deal in reducing erosion just east of the Elwha mouth. The Elwha River sediment quantities included in the EIS are probably much better than any previously estimated quantities; however, these numbers should not be used to calculate a percentage

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SOW-60: Before dam construction, it appears that the current reservoir areas supported at least 48 acres of wetlands (see Section 4.2.4.1). Consequently, the staff expects that wetland acreage lost because of dam removal will eventually be replaced by wetlands that develop along the new river channel through the restored reservoirs. In addition, the staff recommends in Sections 4.2.4.1 and 4.4.4.1 that the sediments at the mouth of Indian Creek be graded to aid in the establishment of a wetland to replace the existing 38-acre wetland in the delta of Lake Aldwell. The section has also been modified to include a staff recommendation for a wetlands delineation prior to dam removal and at periodic intervals to determine if a net loss of wetlands is occurring. If it appears that dam removal is resulting in a loss of wetlands, a mitigation plan would be developed in conjunction with the resource agencies, including the WDOE.

SOW-61: Comment noted. Dam removal would have elements of consistency with the Shorelines Management Act; however, unless the Clallam County Shorelines Master Program was amended, dredging and land filling within a natural zone are prohibited. The staff has noted in Section 4.2.5.2 that these are "technical inconsistencies."

SOW-62: The dam removal alternative now includes a recommendation that the levees be raised as needed to accommodate the 200-year flood (Section 4.2.1.3). Section 4.2.8.2 now describes the increased flooding potential as an effect that would be mitigated.

SOW-63: Section 4.2.8.2 has been revised to show the potential effect on the water supply system, in keeping with the revised dam removal schedule. Section 4.2.2.1 discusses the nature of potential effects.

The time frame for short-term impacts provided in the DEIS were based on sediment movement modeling conducted by the staff. This model and its results are described in greater detail in Appendix C.

SOW-64: Costs are included where they are known.

SOW-65: Staff agrees that artificial nourishment of Ediz Hook might continue to be needed even with dam removal. Section 4.2.8.2 has been clarified on this point.

Comments on Elwah Dam DEIS
June 1991
Page 12

SOW-65 cont'd — contribution to the littoral drift along Ediz Hook. We do concur with your general statement that any Elwha bedload contribution to Ediz Hook would take a number of years before effects to Ediz Hook would take place. The $100,000/year artificial beach nourishment cost to Ediz Hook is correct.

SOW-66 — p. 4-139 — With Glines Canyon Dam removed, and Elwha Dam retained, Lake Aldwell would then fill up in 40 to 60 years. The impact of this occurring is never explained. Would this be a disaster? What would the impact be on fish, sediment load, flooding, socio-economics, wildlife, dam safety, etc.?

SOW-67 — p. 4-139 — The text at p. 5-9 says that with removal of Glines Canyon Dam, Lake Aldwell would fill within 30 to 50 years. Page 4-139 states 40 to 60 years. Which statement is correct? As stated above, what is the impact of the rapid filling of Lake Aldwell?

SOW-68 — p. 4-140 — It is noted in the DEIS that water quality impacts (of removal of Glines only) "would be very similar to those predicted under the removal of both dams."

SOW-69 — p. 4-142 — The two paragraphs near the bottom of the page seem to contain contradictory statements regarding water temperatures in Lake Mills following removal of Glines Canyon Dam. On the one hand, the DEIS says that maximum daily temperatures will slightly increase (due to carry-over of cooler spring runoff), but, then it states that temperatures in Lake Mills will decrease "from an absence of heating and heat storage." Which statements are true, or do they describe a more complex situation wherein both conditions occur, although not simultaneously?

SOW-70 — p. 4-143 — What other alternatives besides off-site could mitigate for shut down of the WDF rearing? Could alternative water supply sources be found nearby? Possibly from temporary ground water sources?

SOW-71 — p. 4-172 — Higher August and September water temperatures (with removal of Elwha Dam only) of 1 to 3 degrees C in the middle and lower reaches could prohibit certification of this alternative under Section 401 of the Federal Clean Water Act.

SOW-72 — p. 4-174 — The FERC staff recommended mitigative measures to minimize higher late summer water temperatures in the middle and lower reaches need to reviewed for other serious water quality problems. For example, the lowering of the Glines

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SOW-66: The staff estimates Lake Aldwell would fill with sediment in 40 to 60 years if the Glines Canyon Project were removed. This estimate is based on the estimated average sediment yield of 281,000 cubic yards per year divided into the lake volume providing a filling rate of about 47 years. The rate of filling would vary greatly depending on how much sediment is allowed to wash in from the Glines Canyon reservoir removal and on yearly variations in transport amounts.

Over time, the available water storage would diminish and the reservoir would take on more characteristics of a river. A gradient would ultimately develop from the upstream area of the reservoir to the invert of the power intakes. Once this occurred, equilibrium conditions would be achieved whereby sediment entering what is now the reservoir would be scoured and conveyed to the power intakes and then discharged through the turbine. At that point, hydroelectric operations might become infeasible due to excessive wear on the penstocks and turbine runners resulting in a need for near continuous rehabilitation.

The ultimate downstream impact to fish would be similar to having natural conditions prevail where no obstructions to sediment transport exist. Flooding would remain essentially unaltered with negligible attenuation of peak flows during flood events. Although not investigated, it is likely that the dam safety concerns would be reduced because of the much reduced water storage capacity behind the dam.

SOW-67: See response SOW-66.

SOW-68: Comment noted. The sediment model employed by the staff predicts that suspended sediment and resulting turbidity values would be equally high in the middle and lower reaches of the river under both of these alternatives. Consequently, water quality impacts would be expected to be very similar under both alternatives.

SOW-69: Section 4.2.2.2 has been corrected to state that average daily water temperatures would decrease during late summer and early fall discharge and climatic conditions following removal of both dams. Maximum daily water temperatures would not be expected to exceed those currently existing in the river under the same conditions discharge and climate conditions.

SOW-70: Revised Section 4.2.2.3 presents a staff-recommended mitigation plan, which would allow for continued use of the WDF fish rearing facility. This plan would use Ranney collectors to minimize the uptake of sediments into the WDF fish rearing channel. Capital and O&M costs for this mitigation measure are provided in Appendix A.

SOW-71: The text has been changed in Section 4.4.3.2. The average temperature changes during the late summer compared to existing conditions will be slightly reduced (0.5 to 1.0°C) in the lower river and will increase less than 1°C during the late summer in the middle reach. No increase in maximum temperature will occur.

SOW-72: The text has been changed in Section 4.4.3.3.

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SOW-72 cont'd — intake may reduce temperatures, but at a cost of lower levels of dissolved oxygen.

SOW-73 — p. 4-184 — As is suggested in the section regarding the Clallam County Shorelines Master Program, dam removal may provide exception benefits to the water and shoreline areas of the river, and would be considered consistent with the policies of the State's Coastal Zone Management Program.

SOW-74 — p. 4-190 — Filtration of the Port Angeles water supply could be required, lasting 1 to 2 years. How was this determined?

SOW-75 — p. 4-197 — It is noted that the applicant's proposal could lead to the extinction of a race, the spring chinook.

SOW-76 — p. 4-197 — The DEIS states that dam removal will result in the loss of reservoir-based recreational opportunities. This reservoir-based use was never documented in the DEIS.

5.0 Summary and Staff Conclusions

SOW-77 — p. 5-9 — Ecology's Solid and Hazardous Waste Program reviewed the DEIS and found no reason to believe the sediments may contain hazardous chemicals. Natural degradation of organics may have generated some toxins, however, which should be further evaluated in the EIS.

SOW-78 — p. 5-10 — Mitigation to the increases in temperature in the lower river and slight adverse effects on dissolved oxygen in the middle reach with the applicant's proposal should be further evaluated.

SOW-79 — p. 5-10 — The beneficial impacts in water impacts following dam removal during the later summer and early fall in the middle and lower reaches is significant.

SOW-80 — p. 5-20 — Under the two dam removal alternative, and under the category "Other Effects," summary statements are made which seem to contradict material presented earlier in the text. "There would be a slight increase in the chance of flooding" does not agree with earlier statements made about an increase in flood depths of 2.5 feet. "Possibly lower long term costs for Ediz Hook Beach replenishment" does not adequately summarize the statement made on page 4-84 that says with dam removal eventually beach nourishment of the Ediz Hook area would no longer be needed. All summary statements within Table 5-5 should be carefully studied to make sure they agree with the EIS text.

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SOW-73: Comment noted.

SOW-74: Section 4.2.2 discusses the effects on the Port Angeles water supply in more detail.

The need for filtration of the Port Angeles water supply has been eliminated under the staff-recommended mitigation plan described in Section 4.2.2.3.

SOW-75: See Section 4.6.

SOW-76: Only a minimal amount of user statistics have been kept for the project reservoirs. It is generally accepted that there is definitely some moderate use of both reservoirs by fishermen and others. Undoubtedly, the removal of these reservoirs would result in some loss to either existing or future use.

SOW-77: Comment and additional information noted. The staff agrees that natural degradation of organics may generate toxins, most notably ammonia. However, these are not likely to reach levels harmful to fish and invertebrates in the Elwha River, except in Lake Mills and Lake Aldwell for short periods during the dam removal.

SOW-78: Slight increases in temperature from fish passage spills are unavoidable due to the stratified conditions of Lake Mills from mid-summer to early fall. Slight adverse effects to dissolved oxygen in the middle reach are also unavoidable for this same reason.

SOW-79: Comment noted.

SOW-80: Table 5-5 has been revised to correctly summarize the impacts discussed in Section 4.

SOW-81

Also under the "Other Effects" category, there are statements made under each alternative concerning downstream water supply filtration costs. They are generally dismissed as being unimportant costs. A review of page 4-91 and 92 does not support this. The treatment of domestic water supplies under the dam removal alternative may increase operation and maintenance costs by $30,000 per year, with an initial capital cost of $100,000. (This may be relatively unimportant compared to other costs presented in the EIS.) However, the text says that increased sediment loads in the Elwha River under the dam removal alternative would result in substantially increased water treatment costs for industrial water users. The text then quantifies these impacts. Why doesn't Table 5-5 summarize these important economic impacts? Chapter 4 should be carefully reviewed to make certain all important impacts are summarized in Table 5-5.

SOW-82 p. 4-21

Table 5-6, summary of consistency with comprehensive plan should be changed to reflect Ecology staff's evaluation that removal of both dams in consistent with the Clallam County Shorelines Master Program.

SOW-83 p. 5-23

Table 5-7 is not a benefit and cost table, it is just a cost table. Economic benefits (e.g. commercial and sports fishing enhancement, reduced Ediz Hook maintenance (etc.) need to be included. If all benefits are going to be included in the analysis, it would be useful to provide benefit-to-cost ratios and net benefits for each alternative presented in the EIS.

SOW-84 p. 5-24

The final sentence in the first paragraph is very important since it indicates a willingness on FERC's part to allow a licensee to "walk away" from their investment should decommissioning and removal be ordered. This seems inconsistent with persistently stated FERC rules, regulations and policy. While broad public interests may be served by restoration of the Elwha ecosystem and may result in other entities to become involved, the EIS, at "(1) Full Licensee Responsibility", should provide the governing regulations that are currently in effect.

SOW-85 p. 5-24

Implementation of the Commission's decision will include state certification under Section 401 of the Federal Clean Water Act. As we have discussed throughout our comments on the DEIS, there are significant water quality concerns with each of the licensing alternatives.

SOW-81: See response SOW-80.

SOW-82: Comment noted. See response SOW-61.

SOW-83: The staff concurs. Table 5-7 has been revised to indicate that it is a cost comparison only.

SOW-84: Comment noted.

SOW-85: We would anticipate that the entity ultimately assigned dam removal responsibility would approach the state for water quality certification.

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SOW-85 cont'd

We are concerned by warnings given to us by the project applicant, that if the Commission orders the dam to be removed, the applicant will not request a water quality certification from the state. Without a letter of request, the state may be without an opportunity to exercise its authorities under the Federal Clean Water Act. The proper procedure should be that FERC should not act on the license application until a letter requesting certification has been received by the Department of Ecology, and the request is understood to include all licensing alternatives, including dam removal. The EIS should evaluate this and other regulatory interpretations which could cloud implementation of the Commission's decision.

Appendix A - Project Alternatives and Cost Estimates

SOW-86 — p. A-38 — The FERC staff has concluded that a Powerhouse second powerhouse at Glines Canyon Dam Expansion is technically feasible and economically beneficial. Average annual anergy production would increase by 23 GWh. How does this affect FERC's licensing decision? Does it make alternatives 1 and 4 more attractive? This powerhouse expansion needs to be more fully discussed in the EIS text.

SOW-87 — p. A-44 — The text states, "If acceptable conditions were not found during geotechnical evaluations, alternative methods of diversion would be required." Recommend that a short discussion on alternatives be presented along with additional costs.

SOW-88 — Fig. A-48 and A-49 — Show where existing "delta" is. If possible delineate "old channel." Draglines are not very efficient. Suggest that other equipment be considered. Statement "Terraces ---- stable & modest slopes ---" Recommend more discussion on what is "stable & modest."

SOW-89 — p. A-51 — State type of equipment that would be used for dredging.

SOW-90 — p. A-111 — The discussions of alternative power sources within the appendix are in terms of average MW, but the alternative project discussions within the text are almost always in terms of energy, e.g., 102 GWh for Glines Canyon Dam and 70 GWh for Elwha Dam. Consistent terms should be used.

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SOW-86: Section 2.2.3 of Appendix A has been clarified to indicate that powerhouse expansion would require a new intake. The new intake, in the view of the staff, would need to be screened to prevent fish entrainment. The combined cost of powerhouse expansion and fish screens exceeds the incremental power benefits from powerhouse expansion. Thus, the staff believes powerhouse expansion only has merit if it is added in conjunction with the relocation and screening of the power intake undertaken for fish protection purposes.

SOW-87: The text has been revised and refers to Section 4.2 of Appendix A for the available diversion options. Costs for the diversion options are less than that for the proposed diversion, but have not been included in the EIS.

SOW-88: Figure A-31 in Appendix A shows the delta area of Lake Aldwell extending to an elevation of about 185 feet. The estimated original channel and proposed location for the new channel are shown with spot elevations.

Figure A-39 in Appendix A shows the original Elwha channel as the proposed new channel. The Lake Mills delta extends to an elevation of about 535 feet.

SOW-89: Equipment type and numbers are presented in the FEIS (Appendix A).

SOW-90: Average MW can be converted to gigawatthours by multiplying the average MW figure by 8.76.

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'HARD H. WATSON
Director

STATE OF WASHINGTON

WASHINGTON STATE ENERGY OFFICE

809 Legion Way S.E., FA-11 • Olympia, Washington 98504-1211

June 27, 1991

MEMORANDUM

TO: Chris Gregoire, Director
Department of Ecology

FROM: Dick Watson, Director

SUBJECT: Comments on the Elwha Dams DEIS

General Comments

Based on our review of the DEIS, FERC staff is to be commended for issuing a comprehensive and thoughtful assessment on a difficult public policy issue. While energy issues and impacts are treated quite briefly, it is clear that FERC has gone to considerable effort to quantify the impacts of dam removal and mitigation alternatives on both the applicant and other electricity users throughout the Pacific Northwest.

Our specific comments address areas that we believe FERC should consider before issuing its final EIS. We would, of course, be prepared to discuss any of these comments with other Washington agencies and FERC staff.

Specific Comments

The Washington State Energy Office has four principal concerns with the Federal Energy Regulatory Commission's DEIS on license renewal for the Glines Canyon and Elwha hydroelectric projects.

SOW-91 First, FERC concludes that removing the dams might result in a modest impact on Daishowa's electricity costs. This is based on a finding that mitigation measures are costly and that Daishowa could acquire replacement power from Bonneville Power Administration at the preference (or PF) rate. In our view, it is reasonable to assume that PF power is available for this purpose and that higher demands on BPA resulting from factors beyond Daishowa's control should not subject the company to treatment as a large new single load under the regional power act. It should be possible to confirm this assumption with BPA prior to issuance of the final EIS.

SOW-92 Second, in our opinion, FERC's overstates the regional or social cost of dam removal by assuming that new coal-fired generation is the long-run replacement resource. We believe this arises from a misunderstanding of the Northwest Power Planning Council's resource stack.

At 2-32, the DEIS states that FERC staff compared "the levelized unit cost of the hydroelectric project to the levelized cost of providing an equivalent amount of power from the region's long-term marginal resource, the Council's benchmark coal-fired powerplant."

(206) 956-2000 or SCAN 494-2000 Telefax (206) 753-2397

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SOW-91: We continue to believe that the PF rate is the appropriate rate for replacement power at approximately present-day mill demand levels. BPA has not indicated otherwise.

SOW-92: The basis for the cost analysis has been changed to the region's avoided cost for a generating resource with a 30-year physical life, as defined by the Council.

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SOW-92 cont'd

The appropriate resource to consider in such an evaluation is the expected cost of all resources in the Power Council portfolio across the range of load forecasts. In the low and medium-low forecasts, the replacement resources are primarily high efficiency cogeneration and conservation both of which are significantly cheaper than new coal power plants. In the high forecast, both coal gasification and nuclear restart are included, but do not dominate the portfolio. Thus the Council's true benchmark for determining the incremental cost of resource development (or loss) is an expected value rather than a point estimate. Such values should be used for FERC's final EIS.

SOW-93

Third, it is our view that FERC's treatment of conservation and cogeneration opportunities at the mill is less than fully satisfactory. While this is clearly acknowledged in the draft EIS, an audit is underway and results may be available in time for the release of the final document.

The draft EIS indicates at 2-38 that staff's conservation estimate is "based on an arbitrary assumption that cost-effective conservation measures can be found in the mill that represent approximately the conservation savings reported by Daishowa American since the beginning of 1989." There is no discussion of cogeneration.

After touring the facility, it is WSEO's staff impression that FERC's conservation estimate, while arbitrary, may not be unreasonable. However, audit results are necessary to confirm this and should be available in time to do so. More broadly, it may also be important to both discuss and assess opportunities that lie outside the purview of a typical industrial audit. These might include savings from changes in product or feedstock mix and the potential for industrial cogeneration.

Neither the cost nor potential for regional private sector industrial cogeneration have been as carefully evaluated as might be inferred from the Northwest Power Plan. The mill may have significant unexamined cogeneration opportunities that are lesser in cost and greater in benefits than the overall regional plan may imply.

While FERC's DEIS states at 2-26 that conservation opportunities at Daishowa are independent of the relicensing issue, this may not be strictly true. There are several reasons that BPA might elect to acquire higher than regionally cost-effective conservation in Port Angeles. Among these reasons are the current capacity limits within the Puget Sound area (which do not apply to the four-state region as a whole), the cost of marginal transmission into the especially constrained north Olympic peninsula, and the possibility of fish and wildlife benefits that could accrue to other river systems in the region. Each of these issues increases the regional value and potential scope of Daishowa mill conservation or cogeneration.

SOW-94

Finally, the draft EIS could be clearer on the relationship between the environmental impacts of dam removal and those associated with mill expansion. As stated at 2-29, Daishowa's proposed expansion "would be associated with an increased annual energy requirement of approximately 195 average MW, or about 1,70 GWh in annual energy requirements." At 2-33, the draft states that the loss of the Elwha and Glines Canyon projects would advance the need for a transmission upgrade into Port Angeles by approximately five years.

While expansion is not being vigorously pursued, some of the environmental consequences of dam removal (including upgrading transmission) may be more directly associated with Olympic Peninsula growth and probable Daishowa expansion than they are with dam removal.

SOW-93: The results of the Daishowa Mill energy audit have been incorporated into the analysis. The mill's cogeneration potential, to the extent that it is cost effective, exists irrespective of the Elwha and Glines Canyon projects. Cogeneration could be used to reduce the amount of purchased power from BPA, whether or not the hydroelectric projects remain.

SOW-94: This comment is consistent with the staff's position that removal of Elwha and Glines Canyon would advance the need for transmission upgrade, not create the need.

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SOW-95 There is also some value in discussing conservation and cogeneration options in light of possible expansion. The cogeneration opportunity in an enlarged facility may be represent a regional resource of considerable value. While it may be difficult to characterize the full range of potential alternatives, a discussion of impacts and opportunities in light of mill expansion should be included in the final EIS.

RHW/as
G-MS-44

cc: Barbara Ritchie, NEPA Coordinator

SOW-95: Refer to response SOW-93. Mill expansion is highly uncertain, and it does not serve as an underlying assumption of the EIS analysis. Discussion of conservation and cogeneration options in light of possible mill expansion is the proper subject of an EIS on mill expansion, not one on Elwha and Glines Canyon licensing.

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STAFF REPORT

COMMENTS OF STATE OF WASHINGTON

RESPONSES TO STATE OF WASHINGTON

STATE OF WASHINGTON
DEPARTMENT OF COMMUNITY DEVELOPMENT
Ninth & Columbia Building, MS CH-51 • Olympia, Washington 98504-4151

June 10, 1991

TO: Christine Gregoire, Director Chris
Department of Ecology

FROM: Chuck Clarke, Director Chuck

SUBJECT: Draft EIS on Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects

Thank you for the opportunity to comment on the draft Environmental Impact Statement on the Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects.

Department of Community Development staff reviewed the draft EIS and consulted with representatives of local and tribal governments in the area of the projects to identify potential local impacts. The attached report summarizes local and tribal government concerns, and offers DCD's recommendations of issues to be addressed in the final EIS.

Please call me at 753-5625, or Mike Grady, Community Planning Section Manager, at 586-8412, if you have any questions.

CC:jls
Attachment

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE GLINES CANYON AND ELWHA HYDROELECTRIC PROJECTS, WASHINGTON

Prepared by:

Washington State Department of Community Development
Ninth & Columbia Building
Mail Stop: GH-51
Olympia, Washington 98504-4151

COMMENTS OF STATE OF WASHINGTON

SUMMARY

SOW-96 Clallam County and the City of Port Angeles share concerns over the economic effect of the proposals to remove or alter the Glines Canyon and Elwha River Hydroelectric facilities. They are concerned that dam removal will greatly diminish local efforts to diversify and stabilize the economy due to the loss of power generated by the dams and the potential adverse impacts on the city's water supply.

SOW-97 The Lower Elwha Klallam Tribe feels they have suffered economic hardship through the loss of salmon runs ever since the dams were built. The Tribe views dam removal as an opportunity to restore salmon runs, which would stabilize and restore its fishing-based culture and economy. The Tribe also views the removal of the dams and restoration of the fisheries as ways to generate substantial gains in the tourism industry.

SOW-98 The County and City agree that water quality issues need further analysis. They are concerned that additional sediments deposited in the river during and after dam removal would significantly degrade the City's only potable and industrial water supply.

SOW-99 The Tribe is concerned that alternative methods of controlling sediment have not been addressed in the draft Environmental Impact Statement. The Tribe would like to see a study of another method which would release less sediment into the river.

SOW-100 The County and City agree that the costs of power conservation efforts have not been adequately addressed in the draft Environmental Impact Statement (DEIS). They would like to see specific conservation gains identified in the final EIS, along with the identification of a source of funds for conservation measures.

SOW-101 The Tribe is concerned that replacement power cost estimates in the DEIS utilized the most expensive alternative. The Tribe would like to see replacement power cost estimates based on less expensive forms of power generation.

RESPONSES TO STATE OF WASHINGTON

SOW-96: Comment noted. Dam removal should not have any effect on power users other than Daishowa America. Also, the dam removal alternative now includes a recommendation that any costs of maintaining municipal and industrial water supplies be borne by whatever entity undertakes dam removal, not by the water users (Section 4.2.2.3).

SOW-97: Comment noted. These points are addressed in the relevant sections on Socioeconomics and Cultural Resources.

SOW-98: Revised Sections 4.2.2.1 and 4.2.2.3 address water quality issues. See also response SOW-96.

SOW-99: The staff has reviewed other sediment control methods, including disposal behind levees as described by Summit Technology. Staff feels, however, that the procedure described in the EIS is the more economical and practical approach.

SOW-100: The results of an energy audit of the Daishowa Mill have been incorporated in the EIS (Section 2.7.3).

SOW-101: The basis for the valuation of replacement power has been changed, and the value has been reduced (Section 2.7.2).

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RECOMMENDATIONS

The Department of Community Development recommends that the final Environmental Impact Statement more fully consider these issues:

Water Quality

SOW-102 - An alternative plan to remove or stabilize sediment should be considered.

SOW-103 - A more detailed study of the costs associated with water treatment should be undertaken.

Power

SOW-104 - Specific conservation gains should be identified.

SOW-105 - The costs of upgrading transmission lines and maintaining power system reliability should be identified.

SOW-106 - The impact on power rates should be more fully explored.

Economics

SOW-107 - A formal economic assessment should be pursued which addresses the following:

1) the funding source for all costs associated with the proposals;

2) identification of local economic diversification opportunities;

3) an examination of the effects of salmon restoration on the local economy, and;

4) an examination of the costs to the Lower Elwha Klallam Tribe of inadequate fisheries restoration.

Fisheries Mitigation

SOW-108 - The effect of higher sediment levels on existing fisheries should be more fully examined.

Dam Safety

SOW-109 - The structural integrity of the dams should be studied.

RESPONSES TO STATE OF WASHINGTON

SOW-102: The main alternatives assessed during the DEIS process were total removal, partial removal, controlled partial removal with in-reservoir sediment storage, and letting all the sediment wash out. Partial removal with in reservoir sediment storage was selected for the FEIS impact assessment.

SOW-103: A more detailed evaluation of requirements and costs have been incorporated into the EIS, Section 4.2.2.3 and Appendix A.

SOW-104: Refer to response SOW-100.

SOW-105: EIS Section 2.0 describes the cost of maintaining system reliability. The cost of transmission upgrade advancement cannot be estimated with any reasonable degree of precision.

SOW-106: The potential effects on power rates are fully explored in Section 2.7.3 and Appendix E.

SOW-107: Section 5.5 notes several options that could be pursued with respect to funding sources for dam removal. Staff does not agree that the EIS requires a complete economic analysis of indirect economic costs or benefits associated with salmon restoration or continued lack of restoration. Local opportunities for economic diversification are beyond the scope of the EIS.

Economic effects on the Lower Elwha Klallam Tribe are discussed in more detail in revised Sections 4.1.8.2, 4.2.8.2, 4.3.8.2, and 4.4.8.2. The revised sections note that all alternatives would have an adverse economic effect on the tribe during the restoration period for chinook, coho, and steelhead, which would vary from 8 to 14 years depending on the species and the alternative.

SOW-108: The sediment effects have been more fully examined in the text (see Section 4.2.3.1).

SOW-109: Dam safety aspects of the projects are periodically reviewed at a minimum of every 5 years under the federal guidelines. The dams have been previously assessed, strengthened, and deemed safe, as noted in Sections 2.1.1.3 and 2.1.2.3.

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COUNTY AND CITY CONCERNS

Local government is concerned that the DEIS does not adequately or accurately address the following issues:

- The ability of the community to diversify and stabilize the local economy after dam removal.
- The cost of maintaining the quality of the city's potable and industrial water supply.
- The loss of power generated by the two Elwha River dams, which local government fears may lead to local brownouts or blackouts.
- The destruction of the wetlands and ecosystems created by the dams.
- Fish restoration efforts after dam removal.
- The costs of dam removal and a resolution of who would bear those costs.

Economic Stability and Diversification

The local economy is closely tied to the health of the ITT Rayonier and Daishowa America mills located in Port Angeles. These mills represent the two largest employers in Clallam County, and are directly and indirectly responsible for approximately 25 percent of the jobs in the Port Angeles area.

SOW-110 The Elwha River is the industrial water source for both mills. Clean water is essential to their manufacturing processes. Water quality will be diminished by dam removal. The technology to efficiently filter and maintain the industrial water supply for the length of time required for the river channel to stabilize may not be available, or could be cost-prohibitive.

SOW-111 Daishowa America relies on the power generated by the Elwha River dams for approximately 40 percent of its power needs. According to plant management, power is the largest single manufacturing cost. The loss of the relatively inexpensive power provided by the dams could affect the ability of the mill to be competitive.

SOW-112 County and city officials are concerned that the loss of power generation and clean water would be a disincentive to business expansion or relocation to the area. These losses would adversely impact local economic diversification efforts, and could lead to a loss of existing businesses.

RESPONSES TO STATE OF WASHINGTON

SOW-109A: Staff responds as follows to these points:

- Community diversification is beyond the scope of the EIS.
- Sections 4.2.2.1 and 4.2.2.3 now include a more complete discussion of the effects of dam removal on the municipal and industrial water supply. See also response SOW-96.
- The effect of the loss of power from the two Elwha River dams on the Port Angeles power supply system is discussed in Section 4.5.2. Staff does not believe that dam removal would lead to brownouts or blackouts.
- Staff believes that effects on existing wetlands are adequately addressed in Section 4.2.4.1. The dam removal alternatives now include recommendations for a monitoring program to track both positive and negative effects on wetlands.
- Appendix A of the FEIS includes an extensive discussion of fish restoration efforts.
- The costs of dam removal have been revised (Section 2.7) and the question of who might pay those costs has been addressed (Section 5.5)

SOW-110: Section 4.2.2 of the EIS includes a more complete discussion of effects on industrial water supplies. See also response SOW-96.

SOW-111: The cost of power to Daishowa America under each alternative has been revised, and its potential effects on the mill's competitive position has been addressed in the Socioeconomics section under each alternative.

SOW-112: The loss of power with dam removal would not affect any other existing or potential business other than Daishowa America. The FEIS stipulates that the cost of maintaining industrial water supply quality would be borne by the entities that would remove the dams, not by the water users (Section 4.2.2.3).

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Water Quality

SOW-113 The Elwha River supplies Port Angeles with all of its potable and industrial water. The City believes that the DEIS grossly underestimates the cost of maintaining potable water during and after dam removal, and the City is concerned about its ability to maintain the quality of the industrial water supply.

Currently the City draws its potable water from the Ranney Well located approximately 60 feet below the river bed. The DEIS estimates that it would cost Port Angeles $100,000 in initial capital outlay and $30,000 per year to remove any additional sediment from the water supply. The City estimates that actual costs could be at least $11.2 million in capital costs for the construction of a water treatment plant, and $362,000 per year in costs associated with operating the plant. The City's estimate is based on a study done by CH2M Hill, and does not include the cost of land for the facility, or the cost to dispose of the additional sludge produced by treatment. The City indicated that the Washington State Department of Health supports the conclusions of the CH2M Hill study.

The City estimates that the cost of treatment could increase single family water rates by approximately $5 per month, or about 50 percent over current single family base rates. The extra sludge produced by treatment would require disposal, which may affect landfill operations and further increase utility rates.

Port Angeles draws its industrial water supply through a diversion of river water. The water is piped to its customers at a very low velocity, and may not be able to carry an increased sediment load. To maintain water quality, an intake filtration system may need to be installed. Costs for this system have not been determined.

Power Loss

SOW-114 The Elwha River dams provide 40 percent of the power requirements to Daishowa America per a contract with the James River II Corporation. If the power source was removed, the mill would need to buy power from the Port Angeles electric utility and the Bonneville Power Administration (BPA). BPA has begun to explore energy efficiency at the Daishowa mill to reduce demand.

However, the additional power requirements on the grid will pose two major obstacles to local leaders: 1) higher power rates; and 2) the need for upgrading the local transmission lines. The costs and environmental impacts of these issues have not been addressed in the DEIS. Local leaders are worried that their ratepayers will bear the burden of these additional costs. The City and County are concerned that additional demands on the local power system will reduce power line stability, resulting in periodic brownouts.

RESPONSES TO STATE OF WASHINGTON

SOW-113: The cost estimates provided by the City, and based upon a study conducted by CH2M HILL, assume that the City's industrial supply will continue to be obtained from surface waters of the Elwha River. The high costs described in the CH2M HILL study are from the capital outlay and O&M costs required for a major water treatment plant for surface water possessing periodically high suspended sediment values. Alternatively, the staff proposes the use of subsurface waters to provide water for industry. This water would be obtained from Ranney collection facilities proposed in the staff's water quality mitigation plan described in Section 4.2.2.3. Water obtained from deep in the Elwha River streambed would have extremely low turbidity values compared to surface waters. Consequently, suspended sediments in the industrial water supply would be minimal and could be treated using current water treatment facilities. Capital expenditures and O&M costs under the staff-recommended water quality mitigation plan are provided in Appendix A.

In addition to the staff-recommended water quality mitigation plan, other measures could be explored to minimize water quality impacts to the City's water supply at less cost than the plan described in the CH2M HILL study. For example, potable water could potentially be obtained from Morse Creek, located east of Port Angeles, during the dam removal period. Morse Creek served as the City's main water supply before uptake facilities were developed on the Elwha River.

SOW-114: The staff believes there is no reason to assume that BPA's rates to the City would increase if the amount of power taken from BPA increases to offset the loss of Elwha and Glines Canyon (reference Section 2.7.3). According to local utility officials (personal communication, Bob Titus, Utility Manager, April 6, 1992), no impact on the local transmission or distribution system is foreseen with dam removal. Currently, the city occasionally provides the mill's full power load and could do so on a routine basis if necessary.

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COMMENTS OF STATE OF WASHINGTON	RESPONSES TO STATE OF WASHINGTON
Destruction of Existing Wetlands	
SOW-115 The wetlands (i.e., Lake Mills and Lake Aldwell) and surrounding ecosystems created by the construction of the dams would be destroyed by dam removal.	SOW-115: The staff agrees that the wetlands associated with the reservoirs would be destroyed by dam removal but expects new wetlands to develop along the new river channel. See response SOW-60.
Fish Restoration Efforts	
SOW-116 Local government is concerned that existing fish stocks could be destroyed by dam removal and fish restoration efforts associated with dam removal may not be successful. It is local government's view that experimental restoration efforts should be focused on rivers that do not currently have dams to see what variables must be addressed for fisheries mitigation.	SOW-116: Comment noted. See Section 4.2.3.1 for short-term effects on fish and Appendix A, Part 3.3 for measures proposed to minimize effects on stocks and to restore runs in the upper river.

LOWER ELWHA KLALLAM TRIBE CONCERNS

Representatives of the Lower Elwha Klallam Tribe have expressed concerns that the draft Environmental Impact Statement does not adequately or accurately address the following issues:

- Sediment stabilization in the event of dam removal.
- The effects of the proposals on the existing salmon fishery.
- The value of restoring all native salmon species to the Elwha River.
- The costs of replacing the power currently generated by the dams.
- Dam safety.
- The subsidy provided by the Tribe for power generation.
- Cultural properties of value to the Tribe.

It is the Tribe's position that removal of both dams provides the best opportunity to adequately restore salmon runs.

Sediment Stabilization

SOW-117 Under the dam removal option, the DEIS outlines a plan to terrace the sediment in order to stabilize it and control its release. The Tribe would like to see an examination of an additional alternative sedimentation stabilization method. Lowering sediment flows would decrease the impacts on water quality and riverbed buildup.

Potential Effects on Existing Salmon Fishery

SOW-118 The Tribe believes the DEIS overstates the potential sediment impact on the existing fishery. Tribal fishery managers have conducted studies that indicate additional sediment in the river would have less than the moderate-to-severe effects on existing fisheries predicted by the DEIS.

Restoring Native Salmon Species to the River

SOW-119 Historically the Tribe, in its original environment, enjoyed fishing year-round on the Elwha River. The fishery provided a subsistence base that included all five stocks of anadromous Pacific Salmon, with a total of 10 different species utilizing the river and its tributaries. Currently, the Tribe operates seasonal common fisheries for Coho and Steelhead, and a seasonal limited fishery for Chinook. As a result, the majority of fisheries income is generated during the five-month period between July and November. Tribal fishing opportunities are not greatly enhanced under the dam retention proposals because the

SOW-117: All removal plans that have been presented by the applicants, Commission staff, various agencies, and the Lower Elwha Klallam Tribe would release significant amounts of sediment. The staff has considered the advantages and disadvantages of each approach. The staff selected the alternative presented in the FEIS because it is workable, uses existing technology, and allows latitude to adjust to site and weather conditions. A lot of variations are available. For example, the storage cell alternative proposed by the Summit Technology report would reduce the amount of sediment released downstream but also adds additional costs and complications in construction. The staff's methods represent reasonably conservative assumptions with respect to sediment concentrations during removal.

SOW-118: See Section 4.2.3.1 for impacts. The effects are still considered moderate to severe in the short term.

SOW-119: Comment noted.

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SOW-119 cont'd

species with the greatest predicted restoration potential would provide a fishery during approximately the same time period as the existing fishery.

Only the dam removal proposal offers the Tribe the opportunity to expand its fishing season, as the potential for restoring a wider variety of species increases. A wider variety of species has the potential of providing a longer fishing season for Tribal members, as migration patterns would be dispersed throughout the year. This could result in significantly increased economic security for the Tribe.

Power Replacement Costs

SOW-120

Power replacement costs in the DEIS were based on coal-fired thermal power, which is considered to be the most expensive form of power generation. Tribal representatives believe the cost of replacing the power currently generated by the two Elwha River dams is exaggerated. According to the Tribe, replacement power costs should be based upon lower cost methods of generation.

Dam Safety

SOW-121

Structural failure of the Elwha River dams is a major concern to the Tribe. The foundation of the original Elwha Dam failed within one month of completion (October 30, 1912) due to unstable soils beneath the dam. In the Tribe's view, the dams should be able to withstand an earthquake registering 9.0 on the Richter Scale.

SOW-122

In the past, the Tribe has had difficulty securing federal funding for housing projects that would be located in the Elwha River flood plain. Funding has been denied by HUD due to the possibility of dam failure.

Power Generation Subsidies Provided by the Tribe

SOW-123

The DEIS discusses the relatively inexpensive source of power that the dams provide to the Daishowa mill. No mention is made of the subsidy the Tribe has provided for that generation. The subsidy consists of the dams' devastation of the Tribe's major source of income, the fear of dam failure, and the loss of access to Tribal cultural history.

The Tribe believes that if James River II were to fully compensate the Tribe for the continued monetary loss of the fishery, the power produced by the dams would not be cost effective.

SOW-120: Refer to response SOW-101.

SOW-121: Comment noted. Refer to response EKT-5.

SOW-122: Comment noted. This point is made in Section 3.9.2

SOW-123: Staff believes that the EIS clearly indicates the negative effects the dams have had on the Tribe.

Cultural Resources

SOW-124 The Tribe is concerned about the continued loss of access to sites of cultural significance that are located beneath the lakes created by the dams. Of particular importance is the Klallam creation-myth site, located beneath the Elwha dam. The Tribe would like a "Traditional Cultural Property Use Study" to be completed on the watershed.

Other Tribal Concerns

SOW-125 - The Tribe does not believe that removal of only one of the dams will result in an adequate restoration of previously existing salmon runs.

SOW-126 - The removal of the Glines Canyon Dam and the resulting release of sediment would increase the Tribe's concern over the safety of the Elwha dam.

SOW-127 - Currently the river is not able to replenish beach material, which results in increased erosion along the Tribe's shoreline and Ediz Hook. The erosion control project on the Hook must be replenished yearly at a significant cost to the tax payers.

SOW-128 - The dams negatively impact biological productivity in the lower river.

SOW-129 - The range of water temperatures discussed in the DEIS may not accurately reflect seasonal temperature fluctuations.

SOW-130 - The dams absorb heat, which raises the temperature of the river, altering the food chain.

SOW-124: See response EKT-2.

SOW-125: Comment noted.

SOW-126: While the staff feel that the safety of the Elwha dam has been adequately demonstrated, even assuming removal of the Glines Canyon dam, acknowledgement of Tribal concerns has been added to Section 4.3.8.2.

SOW-127: Comment noted. This point is made in the Socioeconomics section under each alternative.

SOW-128: Comment noted. The staff has stated that production would be higher without the dams (see Section 4.2.3.2).

Comment noted. The reservoirs reduce biological productivity in the lower river primarily by trapping coarse particulate organic matter (CPOM), which would form the basis for a significant portion of aquatic invertebrate production in the lower river.

SOW-129: The range of water temperatures described in Section 3.3.3 for a 3-year period (1987 to 1989) portrays a wide range of temperature conditions. The temperature conditions result from varied climatic conditions. Climatic conditions varied from hot and dry in 1987 to cool and wet in 1989. The staff believes that the range of conditions described in the EIS adequately portrays seasonal and yearly fluctuations in water temperature.

SOW-130: Comment noted. Seasonal heat retention by the reservoirs has been described in Section 3.3.3. The effects of temperature on primary production, secondary production, predation, and other components of the food chain cannot be assessed from current information.

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COMMENTS OF STATE OF WASHINGTON

STATE OF WASHINGTON
DEPARTMENT OF TRADE & ECONOMIC DEVELOPMENT
General Administration Building • Olympia, Washington 98504-0613 • (206) 753-5630 • (SCAN) 234-5630

June 11, 1991

TO: Christine O. Gregoire
Director

FROM: Paul S. Isaki
Director

J.K. for P.S.I.

SUBJECT: Comments -- Elwha Dam Draft Enviromental Impact Statement (DEIS).

GENERAL COMMENTS

The DEIS is generally well prepared and organized. Substantial additional economic and resource information will, however, need to be provided in the final environmental impact statement (FEIS) before a preferred option is selected.

SOW-131 The potential impacts of the alternatives on Daishowa America's paper mill in Port Angeles are of particular concern to the Washington State Department of Trade and Economic Development. Daishowa is critical to the economic future of Clallam County and the Olympic Peninsula. The company's Port Angeles plant meets all environmental requirements. Daishowa has proven to be a good corporate citizen with a long-term commitment to Port Angeles and the state of Washington. Further, Daishowa's new directory paper de-inking facility will provide both environmental and economic benefits. Because of the broad-based importance of the Daishowa mill, careful attention should be paid to potential impacts on Daishowa's operations and competitiveness during the development of the FEIS.

SPECIFIC COMMENTS

(1). **Executive Summary**

SOW-132 This section identifies three "primary resource objectives" that are used in evaluating the alternatives discussed in the DEIS. Objective Number 3. is described as, the "provision of renewable hydroelectric energy." The question has arisen as to whether this objective might be better described as, the "provision of dependable, competitively priced energy."

RESPONSES TO STATE OF WASHINGTON

SOW-131: The cost of power to Daishowa America has been revised (Section 2.7) and effects on their operations have been estimated insofar as possible.

SOW-132: The EIS scoping process identified provision of renewable hydroelectric energy as the resource objective, and the staff has no basis on which to modify the objectives.

COMMENTS OF STATE OF WASHINGTON

(2). **2.7 Economic Evaluation of the Applicant's Proposal and Alternatives**

SOW-133 (a). 2.7.1 Use of Project Power -- In discussing Daishowa America's plans and operations, this section states, "Currently, mill expansion is not being vigorously pursued." It should be noted, however, Daishowa America is proceeding with the construction of a directory paper de-inking facility that will add substantial quantities of recycled paper to the materials produced at the company's existing Port Angeles facility. Potential impacts of the alternatives on the de-inking facility should be presented in the FEIS.

SOW-134 (b). 2.7.3 Assessment of Daishowa America Mill Power Costs Impacts -- A similar assessment should be provided with regard to the costs of providing the water supplies necessary for both Daishowa and the City of Port Angeles under the dam removal options. (NOTE: It may be more appropriate to address this matter as part of the discussion currently contained in section 4.2.8 of the DEIS.

(3). **4.1 Applicant's Dam Retention Proposal**

SOW-135 Additional information should be provided regarding the community and economic impacts of the construction activities and the recreation, fisheries and wildlife management changes contemplated by this alternative.

(4). **4.2 Removal of Both Dams**

SOW-136 (a). 4.2.8 Socioeconomics -- Additional information should be provided regarding the community and economic impacts of the construction activities and the recreation, fisheries and wildlife management changes contemplated by this alternative.

SOW-137 (b). 4.2.8.1. Construction Impacts -- More specific information is needed with regard to "Project Employment" during the dam removal period.

SOW-138 (c). 4.2.8.2. Long-Term Impacts -- The "Costs of Power" segment of this section discusses potential job impacts, including the extreme impact of mill closure. Severe constraints on Daishowa would cause impacts beyond "mill employees, suppliers and other local businesses." The inability of Daishowa America to operate its de-inking facility could, for example, result in increased pressure on local and regional land fills to accommodate the directory paper that would otherwise be recycled at the mill. Such potential impacts should be considered in preparation of the FEIS.

* * * * *

RESPONSES TO STATE OF WASHINGTON

SOW-133: Section 2.7.3 has been modified to address the Recycled Paper Project.

SOW-134: Section 2.0 has been augmented to include consideration of water supply mitigation and the associated costs.

SOW-135: Staff does not agree that additional information regarding indirect economic effects of the alternatives is needed.

SOW-136: See response SOW-135.

SOW-137: Staff does not agree that more specific information with regard to direct project employment is needed. More specific information would not add meaningfully to weighing the merits of one alternative versus another.

SOW-138: Staff agrees that effects would go beyond employees, suppliers, and other local businesses, and Section 4.2.8.2. has been rephrased to take this into account. Specific impacts such as effects on landfills have not been included, however, because these impacts are entirely speculative. The directory paper mentioned in the comment might go to the landfill, but might also be purchased by some other enterprise.

DRAFT STAFF REPORT

COMMENTS OF STATE OF WASHINGTON

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
Olympia, Washington 98504

June 24, 1991

Mike Palko
Department of Ecology
Environmental Review Section
Mailstop: PV-11
Olympia, Washington 98504-8711

Dear Mr. Palko:

Thank you for your efforts in coordinating a state response to the Draft Environmental Impact Statement for Glines Canyon and Elwha Hydroelectric Projects.

The Department of Health has reviewed the DEIS and concluded that removal of the dams will have serious impacts on the City of Port Angeles water supply, a Ranney collector located on the Elwha river. We believe the impacts are very difficult to predict or quantify but would certainly require the City to provide additional levels of treatment to protect their primary source of drinking water. Likely impacts include:

SOW-139 • Reduced yield from the Ranney system due to sediment release and deposit over the collectors;

SOW-140 • Potential flooding of the intake facility and result impacts on water quality;

SOW-141 • Higher turbidities;

SOW-142 • Increase chlorine demand and thereby concerns regarding disinfection by-product formation;

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SOW-139: Reduced yield from the Ranney system is likely to be small because of the depth at which the system's collectors are located in the riverbed. Backflushing of the Ranney system could be used to increase yields provided sediment accumulations were high enough to clog the intake pipes. Refer also to response SOW-113.

SOW-140: The intake facilities for drinking water are located approximately 60 feet below the Elwha riverbed. Consequently, the intake facilities would not be subject to flooding impacts.

SOW-141: Higher turbidities in the river during the dam removal period would not be expected to significantly impact turbidity values at the City's intake facilities because of filtration provided by 60 feet of river sediment deposits. The need for a daily monitoring program as required by Department of Health regulations is described in Section 4.2.2.3. Refer also to response SOW-113.

SOW-142: The possible need for chlorinating the City's water because of slightly elevated turbidity and bacteria levels is also addressed in Section 4.2.2.3. Costs of chlorination are provided in Appendix A. By-product formation is always a concern when waters treated by chlorine contain dissolved organic matter. Dissolved organic matter concentrations are expected to increase in the river following dam removal. However, concentrations of organic matter should be effectively reduced by dilution with subsurface waters to the point where by-product formation is not a concern.

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SOW-143 The public health implications of these impacts are significant and appropriate mitigation measures must be taken prior to the release of stored sediments. The DEIS should include an engineering analysis to determine the most cost-effective mitigation measures to assure a safe and reliable drinking water supply for the City of Port Angeles.

Thank you for the opportunity to review and comment on the document.

Sincerely,

Dave Clark, Director
Division of Drinking Water
Environmental Health, LD-11
Olympia, Washington 98504

SOW-143: **Comment noted. Refer to response SOW-113.**

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COMMENTS OF STATE OF WASHINGTON

_RT SWITCH
Director

STATE OF WASHINGTON
DEPARTMENT OF WILDLIFE
600 Capitol Way North • Olympia, Washington 98501-1091

June 11, 1991

Ms. Christine O. Gregoire, Director
Department of Ecology
7272 Cleanwater Lane, MS:PV-11
Olympia, WA 98504-6811

Subject: Draft Environmental Impact Statement for Glines Canyon, FERC No. 588, and Elwha FERC No. 2683, Hydro-electric Projects.

Dear Ms. Gregoire:

We have reviewed the Draft Environmental Impact Statement (DEIS) described above and have the following comments to be recorded as the Washington Department of Wildlife (WDW) response.

The WDW appreciates the effort expended by Federal Energy Regulatory Commission (FERC) staff in preparing this document. In general the DEIS is comprehensive, well organized, covers a broad spectrum of issues and presents a fairly objective view of the alternatives.

SOW-144 The WDW strongly supports restoration of natural production of anadromous fish stocks to historic levels in the Elwha River. We also support the replacement of wildlife values lost by inundation of 684 acres of riparian and terrestrial habitat. In our opinion the applicant's proposal and subsequent licensing will not attain the goal of restoring natural production of anadromous fish stocks to historic levels, even for steelhead. Hatchery production is not an equivalent replacement for loss of wild stocks and would not return acceptable numbers of adults to the upper watershed. The applicant's proposal for wildlife mitigation also falls short of complete replacement and restoration of habitat values lost by inundation. Therefore, the WDW maintains, the only means of restoring fish and wildlife resources to acceptable levels is to support the alternative of removal of both projects. Also, we do not view removal of one dam an acceptable alternative since it will not result in full fish, wildlife and ecosystem restoration. The WDW strongly recommends removal of both dams be included as the preferred option in the Final Environmental Impact Statement (FEIS).

SOW-145 We recognize, however, that major decisions must be made regarding replacement power for Daishowa and determining who will ultimately pay for dam removal. Also, solutions must be found to protect downstream water supplies and reduce sedimentation impacts to the river system.

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SOW-144: The WDW recommendation for removal of both dams is noted.

SOW-145: Concerns are noted.

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SOW-146 Preliminary investigations indicate that there are solutions to these problems. Suitable replacement power is available for Daishowa, protection of downstream water supplies is feasible, and the siltation retention proposal developed by Summit Technology, Consulting Engineers, in their report to the Lower Elwha Klallam Tribe, is very promising and may even provide opportunities to create/develop new wetland areas.

SOW-147 Considering the applicant's mitigation proposal and the research data collected to date, the WDW is not optimistic that steelhead could be restored to optimum levels with the dams in place. We are confident that sea-run cutthroat and Dolly Varden could not. The Joint Fish and Wildlife Agencies (JFWA), who have worked on the Elwha over the past 10 years rate steelhead restoration prospects as "fair" and "unknown" for cutthroat and Dolly Varden. The WDW is a member of JFWA and concurs with this analysis. It is therefore our position that the applicant must demonstrate that full restoration of steelhead can be achieved before the projects are licensed. The JFWA has repeatedly requested that additional information be developed on screening, adequate spill levels and the need for development of a specific restoration plan prior to licensing. The DEIS does acknowledge the need for additional information, particularly in recommendations for additional mitigation; however, there is no indication that this information would be required prior to licensing, or how the information would be used. The applicant must demonstrate to the resource agencies satisfaction that full restoration can be achieved prior to licensing.

Specific Comments

SOW-148 Page xxxiv, Executive Summary: The statement that "...steelhead trout (winter run) would have excellent restoration potential in the face of continued passage mortality, harvest pressures, and habitat conditions..." is inconsistent with statements made in other sections of the DEIS, Page 4-12, Table 4-4, and is not biologically sound. WDW biologists rate steelhead restoration potential as "fair," at best, with the applicant's proposal.

SOW-149 Page xxxvi: The Executive Summary states incorrectly that "[a]nadromous fish restoration measures would not commence during the five-year construction period..." of dam removal. Plants of coho and steelhead would likely be made one or two years prior to the end of construction because of freshwater rearing time.

SOW-150 Page xxxvii, Executive Summary: Again the term "excellent restoration potential" for fall chinook and winter run steelhead is used in FERC staff's analysis of Glines Dam removal alternative. This evaluation also predicts "good restoration outlook for spring chinook and coho salmon and summer steelhead." We wonder what biological basis was used to predict this degree of success? Numerous unsolved passage problems still exist even with one dam removed. Some examples are: screens have not been perfected (Eicher may not work for all species); a smolt bypass has not been designed or tested; adequate attraction flows have not been determined; the new spillway has not been completed and tested; extent of adult fallback is unknown; there is no provision for steelhead kelt passage; and the adult fishway is untested. In addition, credible anadromous fishery studies must evaluate through a complete cycle, including analysis of adult returns. Fish passage studies at the Elwha Projects have not included analysis of adult returns, therefore adding another question to the predicted restoration potential with one or two dams in place

SOW-146: The EIS presents the staff's best estimate of adverse impacts from dam removal. We agree that replacement power can be found and that water supplies can be protected.

SOW-147: The staff believes that the system developed for rating each stock's restoration potential is adequate. The staff also believes information is available to adequately determine restoration potential. Sufficient information is also available to determine that some restoration, to the level indicated, would occur under operations proposed. Additional studies recommended by the staff in Section 4.1.3.3 would be used to refine operations (e.g., spill quantity and frequency) and screening operation after licensing. The staff evaluation determined that full restoration would not occur with the dams in place as indicated in Section 4.1.3.2. The staff evaluation, however, considers not only full restoration of fish stocks but other resource objectives (see Section 1.4) as part of its determination of project licensing.

SOW-148: The text has been changed in the Executive Summary.

SOW-149: The text has been changed in the Executive Summary.

SOW-150: The system used for evaluation is explained in Section 4.1.3.2 and in Appendix B. The staff admits that the final characteristics of each component of the juvenile and adult passage system would not be known until all are installed. However, there is sufficient information to determine that success should be within in the range of components presented (see Appendix B). Further tests with the Eicher screen in 1991 indicate good survival for more species and life stages. Smolt bypass systems have been successfully developed at many projects and should not be a problem. Attraction flow for adults has been modified to include the agency-recommended 100 cfs. Adequate survival occurred through the Glines Canyon system with spill flows in the range that would be recommended by the staff. Spillways typically cause only minor mortality if they have a smooth flow with no major obstructions, which would be the case with the new design. Many projects on the Columbia River have substantial fall back with successful passage, the staff has included a high mortality factor with assumptions of passage effects, including losses from fall back. The design of the projects should not result in substantial fall back because release points are away from the spillways.

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2.2 APPLICANT'S DAM RETENTION PROPOSAL

SOW-151 Page 2-11, Facilities: The juvenile passage facilities described in this section are untested. An Eicher Screen has been tested with one species (coho) in one penstock. Adequate testing will require replicates for coho, inclusion of other species, system tests with all four penstocks screened, tests of the entire bypass facility, and evaluation of adult returns.

SOW-152 Page 2-12, Operation: The applicant proposes to fund a broodstock collection and hatchery program for ten years to implement the fish restoration program. Considering the uncertainty of restoration, such a limited commitment is unacceptable. Termination of any restoration efforts must be dependent upon successful completion of the goal. It is quite likely that supplementation of some species may be needed for the life of the project.

SOW-153 Page 2-13, Facilities: Adult passage facilities proposed by the applicant at Glines Canyon Project are untested. We are especially concerned about the electric weir proposed to divert fish to the fishway entrance. Serious problems have occurred in attempting to divert adults with electric current at other projects (Meekin, T.K. 1965 Wells Pre-flood Study).

SOW-154 Page 2-13, Operation: Preliminary studies of smolt passage at Glines indicate excessive mortality at spills of 100 cfs and minimal mortality with 450 cfs spill. Until adequate tests are performed and a determination is made as to the best spill level, we must insist on 450 cfs.

SOW-155 Page 3-53, Wildlife: The discussion on the Habitat Evaluation Procedure (HEP) needs expansion. The HEP was designed to determine original project impacts by evaluating a surrogate area on project lands to represent habitat lost by inundation of the two reservoirs. These habitat values were used to represent original losses caused by the reservoirs. The HEP would also be used to evaluate proposed mitigation lands to determine level of mitigation required to compensate for original project related losses. To accurately determine increased habitat values a HEP should be used after habitat improvements are made.

SOW-156 Page 4-4, Water Quality: The applicant's proposal to use storage in Lake Mills to optimize power production will adversely impact resident and anadromous fishery resources. A fluctuating reservoir limits production in the littoral zone and therefore reduces aquatic productivity of the reservoir. A reduction of flushing flows in the spring will retard migration of smolts and adult anadromous fish.

SOW-157 Page 4-14, Table 4-4: The WDW disagrees with the staff's "Overall Restoration Outlook" for winter run steelhead for reasons stated in our comments for page xxxvii and elsewhere in this response. We also suggest the outlook for summer steelhead be changed to unknown. The availability of native broodstock to restore summer run is questionable.

SOW-158 Page 4-24, Passage: FERC staff is to be commended for the in-depth and reasonable approach used to estimate passage mortality through the projects. We are concerned, however, that a passage mortality of 31% for winter run steelhead may preclude restoration to appreciable levels, especially since several factors were not included in the analysis. These factors are: adult

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SOW-150: cont'd Kelt passage at Glines Canyon would be improved with the increased spill opening. At Elwha, the Eicher screen system should not harm kelts. Additionally, many of the kelts will travel downstream during high spring flows, increasing spill gate openings at Glines Canyon and Elwha. Kelts, although important, are a small part of the returning stock of harvested steelhead stocks. While the adult fishways are untested, ladders and trap-and-haul operations have been found to work at other projects in the Northwest, although with some passage induced mortality as indicated by the estimated passage mortality factor (see Appendix B). Additional studies would help define the exact characteristics of each project and can be used to make refinements, but the staff does not believe they are necessary for evaluating licensing the projects.

SOW-151: Further tests in 1991 have been conducted with chinook fingerling and fry, steelhead smolts, and other species that had a survival rate better than 98 percent. Additional tests are recommended when the other screens are installed.

SOW-152: See Section 4.1.3.3.

SOW-153: The staff has proposed that the trap-and-haul operation at Glines Canyon be redesigned with agency input (see Section 4.1.3.3).

SOW-154: The staff has recommended 200 cfs spill with further testing, see Section 4.1.3.3.

SOW-155: The discussion of the HEP was expanded, as suggested, in Sections 3.5.2, 4.1.4.2, and 4.2.4.2. Since Section 3.5.2 deals with the affected environment, the discussion of the HEP was limited primarily to it use in determining the quality and quantity of existing habitats in the study area. The use of the HEP to determine the value of the original habitats affected by the project and the affects of the applicant's proposed habitat improvement plan are presented in Sections 4.2.4.2. and 4.1.4.2, respectively.

SOW-156: The staff has recommended reduced fluctuations, except when requested for downstream low-flow augmentation (see response NMF-95).

SOW-157: Comment noted. The staff does not believe the lack of an identified stock precludes their potential for restoration although it reduces it, resulting in a stock suitability rating of "marginal," and an overall "fair" rating for the applicant's proposal. Because this system supported summer steelhead in the past, it should be able to in the future if other factors such as passage survival and harvest are adequately controlled.

SOW-158: The staff believes adequate mortality was included. Fall back mortality would be considered part of adult passage mortality; some additional kelt mortality and delayed mortality was included (see Appendix B).

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SOW-158 cont'd — fallback during spill periods; kelt passage mortalities; reservoir delay for smolts and adults; and, delayed mortality (measured by evaluating adult returns).

SOW-159 — Page 4-34, Elwha Fish Ladder Design: Staff's proposal for improvements would most likely result in improvements, however, to assign loss percentages of five to seven percent is questionable. Each project is unique and must be evaluated before accurate assessments can be made. For example, there is no guarantee that 100 cfs is an adequate passage or attraction flow.

SOW-160 — Page 4-35, Contingency Plan for Elwha Dam Downstream Passage: We concur with staff that Eicher screen effectiveness remains uncertain and that conventional screens should not be ruled out with dams in place. We disagree, however, that "Conventional screening of salmon and steelhead smolts is a proven technology... [and] ... would provide 98 percent smolt survival."

Studies show a wide variability of effectiveness with conventional screens depending upon each project. We are not aware of a similar project in the northwest where 98 percent steelhead smolt survival is attained with conventional screening. Again, each project is unique and must be evaluated before accurate predictions can be made.

SOW-161 — Page 4-35, Glines Canyon Project Trap-and-Haul Upstream Fish Passage Facilities: The WDW concurs that a trap-and-haul passage facility at Glines would be acceptable if designed properly. Any new facility must, however, be subjected to extensive testing before effectiveness can be determined.

SOW-162 — Page 4-35, Fish Passage Monitoring Programs: WDW concurs with the staff's analysis that the applicant's fish passage proposals "...all contain relative degrees of uncertainty..." and would add conventional screens to that category. We do not agree that spill tests should be conducted under 100 cfs. We are convinced from studies and past experience that 100 cfs is not adequate. We are concerned that corrective measures in the Glines plunge pool may not have solved all problems associated with low spill volumes. Also, the applicant's spill proposal will not allow kelts to safely exit Lake Mills.

SOW-163 — Page 4-36, Anadromous Fish Restoration Plan: We concur with the staff recommendation that the outplanting program continue for an indefinite period and be terminated only after it has achieved its objectives. The costs of the dam retention alternative should be adjusted to include continuation of outplanting and monitoring for the 50-year licensing period.

SOW-164 — Page 4-39, Vegetation Modification: The applicant's wildlife mitigation proposal needs an independent review by a consultant with expertise in forestry and terrestrial vegetation manipulation for the benefit of wildlife and their habitat needs. This should be subjected to review and approval by WDW and the U.S. Fish and Wildlife Service (USFW). The plan as proposed has merit but needs to be expanded and refined. For example, the applicant must evaluate surrounding habitat as well as project lands to determine the best means to increase habitat values on project to benefit species ranging beyond project lands.

SOW-165 — Page 4-40, Vegetation Disturbance: The staff's recommendation for revegetation is good; however, we propose native plants be used to the extent

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SOW-159: The staff acknowledges that every situation is unique, but the staff does not believe this situation is so unique as to assume that mortality would be higher than the 5 to 7 percent. The staff has recommended additional flow at Glines Canyon.

SOW-160: The 98 percent survival rate is based on studies on the Columbia River (NPPC 1989), with vertical traveling screens. These screens could have higher mortality than a more conventional screen considered as backup design at Elwha dam, because the Columbia River screens do not meet conventional screening velocity criteria. The staff acknowledges that every situation is unique but believes the assumption of 98 percent is reasonable with the current design proposed to meet current screening criteria. As stated, testing would be required to refine operations if these screens were installed.

SOW-161: Comment noted.

SOW-162: Comment noted. See Section 4.1.3.3.

SOW-163: See recommendations in Section 4.1.3.3. Costing analysis was limited to 20 years. It is likely that substantial restoration would occur before 20 years, so long-term activities would be greatly reduced in magnitude and cost. Therefore, although the staff recommends that restoration stocking could occur beyond this period and that the applicant is responsible for further activities if passage problems are still not adequately addressed, it is not reasonable to extend cost estimates for the entire license period.

SOW-164: The staff agrees and has included several measures designed to increase the success of the applicant's habitat improvement plan including analysis of deer and elk forage habitat outside the study area boundaries, the addition of a monitoring and maintenance program, and a big game radio telemetry study (see Section 4.1.4.2). All plans involving habitat manipulations for wildlife should be subject to review by the WDW and FWS.

SOW-165: Section 4.1.4.1 has been modified to include a recommendation for the use of native species for revegetation, to the extent possible.

The applicant conducted bald eagle surveys in 1989 to 1990 (see Section 3.5.3.1) and determined that wintering use of the study area was very low and no nesting occurred. The applicant's proposal is not expected to impact bald eagles since: 1) this species uses the study area only occasionally; and 2) most of its use occurs in the winter and any construction or habitat improvement activities would occur in the summer. Consequently, the staff does not agree that additional bald eagle surveys are necessary.

Section 4.1.4.3 has been modified to include a staff recommendation for spotted owl surveys prior to any of the timber removal activities proposed under the applicant's proposal. Sections 4.2.4.3, 4.3.4.3, and 4.4.4.3 have been modified to recommend similar surveys prior to dam removal activities.

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SOW-165 cont'd — possible. Also, spotted owl and bald eagle surveys must be conducted to satisfy the Endangered Species Act requirements.

SOW-166 — Page 4-41, Wildlife: The WDW strongly disagrees with the staff's assertion that "...applicant's proposal would result, overall, in positive effects on wildlife." The Elwha Project inundated 267 acres from 1912 to date, and Glines Dam inundated 415 acres from 1927 to date. The applicant's proposal to set aside 708 acres from future development and conduct prescribed vegetation manipulation on an additional 189 acres will provide wildlife benefits. However, this will not compensate for 682 acres of valuable wildlife habitat lost for 60 to 80 years. The reservoirs eliminated habitat for many species, disrupted migration routes, reduced available winter range and resulted in extirpation of many animals dependent upon this habitat. Manipulation of habitat to increase wildlife values is very difficult as one must first consider existing populations and surrounding habitat conditions. For example, it may not be beneficial to increase forage conditions for big game on project lands if surrounding off-project lands are forage-rich. An analysis must be made of limiting factors for various species and attempt to improve on these. The applicant's proposal has not considered off-project lands and surrounding habitat conditions. Judgement as to the effectiveness of the wildlife mitigation proposal cannot be determined until monitoring (HEP) shows habitat values have been increased to desired levels commensurate with goals to compensate for habitat loss. If habitat values are not increased to desired levels, additional mitigation should be required.

SOW-167 — Page 4-42, Habitat Modifications: The applicant conducted a HEP to determine habitat losses resulting from inundation of 682 acres. Assessment of the effects of enhancement measures can only be evaluated after these measures have been implemented and a HEP conducted on project lands.

SOW-168 — Page 4-43, Table 4-10: In general, we feel the Habitat Units (AAHU's) with enhancement may be overly optimistic in terms of increased habitat values. The final EIS should explain that the AAHU's, with improvement, are based on a projection over a 50-year period and not on actual habitat measurements on enhanced mitigation lands.

SOW-169 — Page 4-43, Big Game: We concur with the staff's belief "that protecting nearly 900 acres from timber harvest and developing and promoting the growth of old growth forest, which represents optimal habitat for deer and elk, would benefit all big game species..." but do not concur this will replace all losses created by the projects.

SOW-170 — Page 4-51, Wildlife Habitat Maintenance and Monitoring Programs: We concur with staff's recommendation for monitoring and recommend the HEP be used to determine habitat values during and after enhancement measures are implemented

SOW-171 — Page 4-52, Construction Impacts: Spotted owl surveys must be conducted and a mitigation plan developed if owls are found in the vicinity.

SOW-172 — Page 4-56, Long-Term Impacts: We do not concur that the applicant's proposal is "... generally consistent with WDW's Strategies for Washington Wildlife Plan." We do not agree that the applicant's proposal would, "...improve spawning and rearing habitat, ... " and it is not consistent with the WDW mitigation policy of no net loss of habitat.

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SOW-166: It is the policy of the Commission to require mitigation for impacts resulting from new facilities or operational changes proposed during licensing of existing projects. Mitigation is not required for original or continuing impacts from existing projects. Instead, the applicant and resource agencies are requested to identify opportunities for enhancement or improvement of the resources associated with the project.

The staff recommends that the applicant re-evaluate its big game habitat improvement plan to take into account forage availability outside the study area. In addition, the staff recommends that the applicant design a monitoring and maintenance program that would include a HEP to evaluate the success of the proposed improvement measures and a contingency plan if the program fails (see Section 4.1.4.2).

SOW-167: The staff agrees. See response SOW-166.

SOW-168: Section 4.1.4.2 has been modified to explain that the AAHU's expected from the applicant's habitat improvement plan represent projections and are not based on actual measurements.

SOW-169: Comment noted. See response SOW-166.

SOW-170: Section 4.1.4.2 has been modified to include a staff recommendation to use the HEP to determine habitat values resulting from the applicant's habitat improvement program.

SOW-171: Section 4.1.4.3 has been modified to include a staff recommendation for spotted owl surveys prior to any of the timber removal activities proposed under the applicant's plan. Sections 4.2.4.3, 4.3.4.3, and 4.4.4.3 have been modified to recommend similar surveys prior to dam removal activities.

SOW-172: In evaluating potential changes to existing projects, the Commission adopts a forward-looking approach, using present conditions as a baseline and concentrating on current resource opportunities for project improvement. The staff does not see the opportunity for improving spawning and rearing habitat as a "make-up" for any habitat loss.

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SOW-173 Page 4-60, Sports Fishing: As mentioned in previous sections, the WDW is not optimistic that the applicant's proposal will have a "good" chance of restoring winter or summer run steelhead to optimum levels. The reasons we are not optimistic are as follows:
1) uncertainty of screening;
2) untested smolt bypass facility at Elwha;
3) untested proposed revisions to Elwha spillway;
4) minimum spill proposed at Glines;
5) untested adult passage facilities;
6) potential adult fallback mortalities;
7) no provision for kelt passage; and,
8) no complete studies to evaluate adult returns.

SOW-174 Page 4-61, Sports Fishing: Since we do not know the impacts on resident trout, we suggest the sentence in the second paragraph be changed to "...trout fishing could be negatively impacted."

SOW-175 Page 4-74, REMOVAL OF BOTH DAMS: As mentioned in our introductory comments, we are optimistic that measures can be taken during dam removal to minimize siltation and subsequent long-term impacts to downstream resources. We recommend that levees constructed to contain materials and stabilize the river channel be set back far enough to allow the new river channel to meander naturally within these berms. Also, we feel there will be many opportunities to create wetlands within the reservoir basins. We suggest every opportunity be explored to create new ponds or wetlands. This could mitigate impacts for loss of trumpeter swan habitat created by the reservoirs.

SOW-176 Page 4-101, Steelhead: The first paragraph in this section is very confusing and should be rewritten. As mentioned previously, we do not agree that winter run steelhead restoration potential is "excellent" under the applicant's proposal, and we are confident that mortality reduction would be significant, with dams removed, rather that "slightly" as stated. We also feel that restoration potential for winter run steelhead would be much greater with dams removed not "the same" as stated in this paragraph.

SOW-177 Page 4-102, Habitat: We question the statement that "[s]pawning and rearing habitat would be improved slightly for summer and winter run steelhead..." with dams removed. Both summer and winter run steelhead are known to spawn in mainstem large rivers. The addition of approximately five miles of suitable spawning and rearing habitat would be more than a slight improvement to this resource.

SOW-178 Page 4-104, Resident Trout: We do not concur with the statement that "[r]earing habitat could be reduced from the loss of reservoir areas..." Studies show free flowing stream habitat is much more productive rearing habitat, especially for rainbow trout, than a reservoir. The assumption that "...little change would occur in trout abundance with conversion of Lake Aldwell to a river reach, while a 50 percent reduction would occur in the Lake Mills reach" is not based on sound biological analysis. Catch per linear mile is not an accurate indicator of abundance; and, further, you cannot assume that abundance in a given body of water at any given time period is a good measure of productivity of that body of water. For example, it is highly likely that most of the trout (rainbow and Dolly Varden) are produced in the free flowing river and move into the reservoirs to feed during certain times of the year.

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SOW-173: Comment noted and considered.

SOW-174: The staff's conclusion is that resident trout fishing would be negatively affected.

SOW-175: Building levies to stabilize and protect the lake bottom sediment from flood erosion while allowing the full meander path for the river would involve far more hydraulic dredging and cost than proposed in the Commission staff or Summit Technology reports.

Wetlands could be built and many would form naturally in the reservoir areas.

The staff agrees that it is likely that new wetlands will form along the river channel through the areas currently occupied by the reservoirs. A staff recommendation for monitoring developing wetlands has been added to Sections 4.2.4.1, 4.3.4.1 and 4.4.4.1. In Section 4.2.4.1, the staff also recommends grading the sediments in the vicinity of the confluence of Indian Creek with the Elwha River to replace the largest wetland expected to be eliminated by the dam removal alternative.

SOW-176: The text has been changed in Section 4.2.3.2.

SOW-177: See response DOI-198.

SOW-178: The text has been changed in Section 4.2.3.2. However, the staff has retained the statement about loss of rearing habitat.

There are examples of reservoirs in western Washington that supply good trout fisheries (e.g., Ross Lake and Spada Lake) probably in excess of what would occur for a river of the same length. This suggests that loss of reservoir areas can easily reduce production of a system. When comparing the productivity of rivers versus reservoirs, it is important to remember that rivers for a given stream length are much smaller than reservoirs. While streams might be more productive per unit surface area than the reservoirs, the reservoirs on the Elwha have about 10 times the surface area per linear mile than the corresponding river. This means that for the stream to equally produce fish as the reservoir, it would have to have 10 times greater production per unit surface area than the reservoirs. Because these reservoirs are oligotrophic, they have good water quality conditions for trout, including relatively low temperatures and high dissolved oxygen. Even if the production were low in the reservoirs, it is unlikely that the streams would be 10 times more productive per unit surface area than the reservoirs. The catch data are reported for the reservoirs without stocking, which indicates that while not all life stages will succeed in the reservoirs, they do supply useful rearing habitat. In addition, fish might migrate in and out of the reservoirs even though this would indicate that reservoirs supply useful rearing habitat.

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cont'd As mentioned above, it is common knowledge that streams are more productive for trout than reservoirs.

SOW-179 Page 4-104, Fish Community: We concur with the statement that "[r]emoval of both dams would bring about an overall positive change in the fish community of the Elwha River."

SOW-180 Page 4-106, Construction Impacts: We recommend that other alternatives be explored for disposal of the concrete rubble from the diversion tunnels and dams. Possible uses could include rip-rap, road fill, industrial fills, or other areas less disruptive than disturbing terrestrial habitat.

SOW-181 Page 4-109, Potential Loss of Wetlands: As mentioned previously, there will be an opportunity to create new and more extensive wetlands if the reservoir reclamation and sediment retention project is designed properly.

SOW-182 Page 4-112, Wildlife

SOW-183 Page 4-113, Long Term Impacts: The suggested loss or degradation of habitat along the river in Sweets Bottom and the lower Elwha due to increased erosion, siltation, or changes in hydrology should not be categorized as long term impacts. This area will return to a natural riparian community in the near future.

SOW-184 Page 4-120, Staff Recommendations: We generally agree with staff's recommendations; however we suggest additional measures to offset wildlife and habitat losses. We suggest, in addition to habitat restoration measures for wildlife, that the Applicant's proposal for wildlife mitigation also be implemented to protect habitat surrounding Lake Aldwell. This can be justified considering the long term (60 to 80 years) loss of wildlife habitat and subsequent loss of many wildlife species dependent upon habitat inundated by the reservoirs. In addition, the people of this state have lost recreational opportunities associated with this habitat and wildlife loss. These losses must be compensated.

4.3 GLINES CANYON REMOVAL WITH RETENTION OF ELWHA

SOW-185 Page 4-112, Wildlife: We concur that there will be temporary impacts to wildlife during dam removal and restoration activities. It is our position, however, that long term benefits of returning 759 acres of riparian and terrestrial habitat to a natural state will more than offset temporary impacts.

SOW-186 Page 4-144, Long -Term Impacts: We do not concur that restoration potential for winter run steelhead would be "excellent" under the Glines Canyon Dam removal alternative. The same problems would exist at Elwha Dam in terms of unknown-passage-mortalities as discussed under the applicant's proposal in previous sections. In addition, we would be concerned about the large volume of silt trapped in the Aldwell reservoir and subsequent turbid water conditions in the reservoir and downstream area for years after removal. The Nisqually River system is a prime example where a reservoir becomes saturated with glacial silt and causes water quality problems in the reservoir and the river below.

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SOW-179: Comment noted.

SOW-180: Section 4.2.4.1 has been modified to include a staff recommendation for exploration of alternative means of rubble disposal.

SOW-181: Comment noted. See response SOW-175.

SOW-182: Comment noted.

SOW-183: The staff agrees. The impacts to habitats adjacent to the river due to increased lateral erosion in Sections 4.2.4.1, 4.2.4.2, 4.3.4.1, 4.3.4.2, 4.4.4.1 and 4.4.4.2 have been reclassified from long-term impacts to short- term impacts.

SOW-184: See response SOW-166. The staff agrees that protecting the habitat around Lake Aldwell would be beneficial to wildlife regardless of dam retention or removal. However, the Commission has no authority to require an applicant to make habitat improvements for projects that no longer exist. Consequently, the applicant's proposal to protect the habitats surrounding Lake Aldwell cannot be implemented as part of the dam removal alternative. If the dams are removed, the staff recommends that the state, NPS, tribes, and conservation organizations consider some way to purchase and protect the land owned by the applicant.

SOW-185: Comment noted.

SOW-186: Considering all factors, the staff believes the rating system is suitable for this stock. Initially, there would be several years of high turbidity, but the system is expected to stabilize as the finer matter would be mostly carried out of the system. The lack of drawdown in Lake Aldwell also would prevent further erosion of the delta. The situation would not greatly differ from the annual outwash from a delta that is already present in the system. The Nisqually River differs substantially from the Elwha. It has a larger more active glacier in the headwaters that continually supplies the river and delta with glacial till above the reservoirs. The information available for the Elwha suggests this system is naturally much clearer. The suspended solids and turbidity data from the gage station below Glines Canyon dam (Table 3-4) indicate turbidity remains low. Also, Secchi disk measurements in Lake Mills during the summer were usually over 20 feet deep, indicating good water clarity.

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SOW-187 Page 4-149, Wildlife: If the applicant's proposal were implemented as staff recommends, and habitat restored in the Glines reservoir area this could result in positive benefits to wildlife compared to the Applicant's proposal.

4.4 ELWHA REMOVAL WITH RETENTION OF GLINES

SOW-188 Page 4-172, Long-Term Impacts: Although expected restoration potential for winter run steelhead would most likely be better under this proposal compared to retention of both dams or the Elwha Dam retention alternative, our concerns remain, that a prediction of "excellent" may be overly optimistic until adequate studies are conducted and commitments made as recommended in previous comments.

SOW-189 Page 4-176, Wildlife: Restoration of Aldwell reservoir area habitat to original conditions and implementation of the applicant's wildlife mitigation proposal would result in overall benefit to wildlife compared to the applicant's proposal.

5.2 COMPARATIVE ASSESSMENT OF OTHER ENVIRONMENTAL EFFECTS

SOW-190 Page 5-12, Aesthetics: We suggest FERC staff remove statements in this section and throughout the draft where subjective judgments are made and conclusions reached with little factual basis. The statement "...replacement of the blue waters of Lake Mills with an early successional forest on large terraces would be considered an adverse effect by most viewers" is not based on fact and may not be true.

5.4 COMPARATIVE ECONOMIC COSTS OF THE ALTERNATIVES

SOW-191 Page 5-23, Table 5-7: We disagree with the inclusion of foregone generation in this table, and in the calculation of "total net costs." We suggest instead, inclusion of foregone fish, wildlife and recreational opportunities lost since the projects were built. For example, projecting the commercial and recreational value of 100-pound chinook salmon lost from the 1920's to present should be added to the cost of the applicant's proposal. Also, the resource agencies and FERC staff recommended mitigation measures, monitoring studies, fish restoration, etc. should be added to the cost of the dam retention alternatives.

5.6 PRELIMINARY FINDINGS

SOW-192 Page 5-24: We generally agree with conclusions 1, 3, 5, and 6. However, we disagree with conclusions 2 and 4.

SOW-193 Conclusion 2: We do not agree that the Applicant's proposal will result in "meaningful improvement" over the current conditions for fish and wildlife. Providing for "potential" anadromous fish access to the upper river is still a very uncertain prospect and will not result in ecosystem restoration. Even if restoration is successful, the runs would not present significant harvest opportunities.

SOW-194 Conclusion 4: We disagree that dam removal is "...associated with extremely high costs, technical challenges of a high order, and very substantial adverse

RESPONSES TO STATE OF WASHINGTON

SOW-187: The staff agrees.

SOW-188: The staff has retained the assessment. Based on the rating criteria (all four categories with a "favorable" classification), the overall restoration potential would be ranked "excellent."

SOW-189: The staff agrees.

SOW-190: The text has been revised in Sections 4.2.7, 4.3.7, and 5.2.7 to point out that different viewers would perceive and respond to situations and conditions differently.

SOW-191: The cost of staff-recommended measures has been added to the applicant's proposal with supplemental measures (Section 2.2.5). A back-casting of commercial and recreational costs from the 1920's is not relevant to the Commission's decision in this proceeding. In considering the licensing of existing projects, the Commission looks to the future in an attempt to improve current conditions in a balanced manner.

SOW-192: Areas of agreement and disagreement noted.

SOW-193: The text has been modified to delete the word "meaningful." Nonetheless, the applicant's proposal would represent a fish and wildlife improvement compared to current conditions.

SOW-194: Comment noted. Refer to response SOW-191. The South Fork Toutle River experience has been incorporated in the analysis (Section 4.2.3.1).

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SOW-194 cont'd

impacts during and immediately after removal." The costs of dam removal are not excessive when compared to restoration of an ecosystem and associated fish and wildlife benefits that have been depressed since the 1920's.

As mentioned above, cost of resources lost since the dams were built should be included in this analysis. The comments relating to the technical aspects and adverse impacts of dam removal are not supported by the facts as presented in the rest of the DEIS. Also, it may be valuable to investigate the South Fork Toutle River siltation (resulting from Mt. St. Helens eruption) and subsequent self restoration as a comparison.

SOW-195

Conclusion 6: We would rate both single dam removal scenarios poor in terms of fish, wildlife, and ecosystem restoration. Also, these alternatives result in significant cost increases for the power generated by the single remaining project.

The Washington State Department of Wildlife appreciates the opportunity to comment on this document and hope our comments will be seriously considered by FERC staff in the development of the final EIS.

Sincerely,

Curt Smitch
Director
CS:pd

cc: Kaleen Cottingham
Chris Drivdahl
Jim DeShazo
Elwha Tribe
NMFS
WDF
USFWL
NPS

SOW-195: Comment noted.

WASHINGTON STATE DEPARTMENT OF
Natural Resources

BRIAN BOYLE
Commissioner of Public Lands

Division of Lands & Minerals LB-13
Olympia, Washington 98504
(206) 586-6382, FAX (206) 586-5646

June 7, 1991

Christine Gregoire, Director
Department of Ecology
Mail Stop PV-11
Olympia, WA 98504

RE: DEIS Glines Canyon and Elwha Hydroelectric Projects

Dear Ms. Gregoire:

Thank you for your efforts in coordinating a state response to the Draft Environmental Impact Statement for the Glines Canyon and Elwha Hydroelectric Projects.

The Department of Natural Resources has reviewed the DEIS from two perspectives of public land management, aquatic lands and upland trustlands. Comments from these two perspectives follow, and are submitted in the interests of the department's separate proprietary roles for these programs.

Upland Trustlands

1) Commercial Thinning Program:

SOW-196

Over the past several years, the Department of Natural Resources has developed and implemented a program to commercially thin large areas of State Forest Trustland on the Olympic Peninsula. The objectives of the program are to improve the quality of the residual timber, to create critical wildlife habitat and to provide greater utilization of the trust assets while promoting a quality forest environment.

The Daishowa mill is a critical subcontractor purchaser of the pulp wood fiber that is marketed from 2500 acres under the thinning program. The Department is planning to increase this important program to 1000 acres per year in the near future.

If Daishowa looses a significant portion of their power as a result of dam removal, the increased cost of securing adequate power to the mill could result in Daishowa's seeking a less expensive source of pulp producing wood fiber.

The effect on the Department's thinning program would likely be to severely reduce the program as a result of the loss of the Daishowa mill's ability to pay the price necessary to support the thinning program.

SOW-196: Comment noted.

STAFF REPORT

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5) Northern Spotted Owls:

SOW-197 It is apparent that portions of the land area addressed in the DEIS may lie within the protection areas of Northern Spotted Owls. Proposed forest practices within these areas, such as timber harvest or road construction activities on state or private forest lands, will be reviewed under authority granted by the Forest Practices Act and the State Environmental Policy Act.

Aquatic Lands

SOW-198 There does not appear to be any discussion of the effects, both short and long term, of increased sediment loads on the nearshore marine biological communities. The geological portion of the document identifies that there would be a dramatic increase in the longshore sediment load moving east to Ediz Hook. This sediment load would dramatically effect the marine plants and benthic animals in the nearshore area. Most likely there will be decrease in the abundance of kelp with a possible effect on nearshore salmonid movement. In addition, the nearshore animal community would be altered.

It is strongly recommended that the EIS address the effect of the increased sediment load on the biology of the nearshore area. If you have questions pertaining to the aquatic lands concerns, please contact Dr. Dave Jamison at (206) 586-2653.

If you have questions pertaining to the upland trustland concerns, please contact Rich Hsu, Olympic Region Assistant Manager at (206) 737-6131.

Sincerely,

David F. Dietzman

David F. Dietzman
SEPA Center Manager

c: Art Stearns, Supervisor, Department of Natural Resources

RESPONSES TO STATE OF WASHINGTON

SOW-197: Comment acknowledged. See response SOW-165.

SOW-198: Nearshore effects are addressed in Section 4.2.3.1. Data are not sufficient to make detailed long-term predictions on all marine resources. The potential change in important shellfish resources and effects of possible increased estuary for salmon stocks are discussed in Section 4.2.3.2.

COMMENTS OF STATE OF WASHINGTON

JOSEPH R. BLUM
Director

STATE OF WASHINGTON
DEPARTMENT OF FISHERIES
115 General Administration Building, M.S. AX-11 • Olympia, Washington 98504 • (206) 753-6600 • (SCAN) 234-6600

June 12, 1991

Department of Ecology
Environmental Review Section
ATTENTION: Mike Palko
Mail Stop PV-11
Olympia, Washington 98504-8711

SUBJECT: Comments on DEIS for the Elwha and Glines Canyon Hydroelectric Projects

Dear Mr. Palko:

The Washington Department of Fisheries (WDF) has reviewed the Draft Environmental Impact Statement (DEIS) for the Glines Canyon and Elwha Hydroelectric Projects and has the following comments:

GENERAL COMMENTS

SOW-199 The DEIS lists four alternatives for the reintroduction of anadromous fish into the Elwha watershed above river mile 4.9. WDF normally favors the use of inaccessible habitat by salmon and steelhead to increase the natural production of anadromous fish in Washington State. However, before we endorse any of the alternatives, they must be determined to be feasible and result in a net gain for the Elwha River salmon resource.

SOW-200 WDF suggests the DEIS should also consider a "no-action" alternative, which would provide a relevant baseline for proper impact assessment of each of the four action alternatives. Adding a "no-action" alternative would fill a void in the DEIS and create an FEIS that can be used for sound decision making, especially regarding the selection of a preferred alternative.

SOW-201 The DEIS emphasizes the possible long-term benefits of reintroducing salmon into the upper Elwha. However, the document tends to gloss over the potential short-term impacts regarding the very important salmonid resources currently produced in the lower river and the extensive fish cultural programs at the WDF chinook rearing channel and tribal coho and steelhead hatchery. The DEIS indicates serious water quality degradation could occur for an 11-15 year period if dam removal was undertaken. Chronic high turbidity and periodic releases of sediments could cause significant losses of the salmonid runs produced in the lower Elwha River. These potential losses need to be identified and quantified to fully assess adverse impacts on the existing anadromous fish stocks and make an informed decision on long-term net benefits from potential actions.

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SOW-199: Comment noted.

SOW-200: The EIS baseline used for comparative assessment of impacts is present-day environmental conditions. The EIS scoping process failed to identify a reasonable no-action alternative.

SOW-201: Additional assessments of short-term impacts have been included in Section 4.2.3.1.

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SOW-202 Mitigation for these possible short-term impacts also needs to be addressed, especially the WDF rearing channel, which could be shut down for up to five years. Out-of-basin mitigation is not a feasible option at this time. Other options need to be explored as a means for mitigating for this and other in-river impacts.

SPECIFIC COMMENTS

Executive Summary

SOW-203 **Pg. xxxvi, p.2** - The text states that "Anadromous fish restoration measures would not commence during the five year construction period because of these largely unavoidable sediment impacts." What is the extent of these impacts and what will they do to the existing downriver fish production?

SOW-204 **Pg. xxxvi, p.3** - The document suggests "... that the proposed dam removal process would be expected to restore the river to original habitat conditions approximately 10 to 20 years after the end of construction." Does this mean that adverse environmental impacts could occur for 15 to 25 years from the commencement of the project? To what degree would they persist through this period?

Purpose and Need for Action

SOW-205 **Pg. 1-4, p.4** - The choice to not consider a "no action" alternative is said to be unreasonable because "... all parties to the proceeding were dedicated to modification of existing projects...." While this may be true, it still behooves the Federal Energy Regulatory Commission (FERC) to develop a "no action" option for establishing an information baseline to determine accurately both the adverse and beneficial aspects of each of the action alternatives. The FEIS will be incomplete without knowing how the four proposed alternatives affect existing fish stocks in the Elwha basin. If the FEIS is to choose a preferred option intelligently, full knowledge of the extent of all relevant impacts should be made available.

Proposed Action and Alternatives

SOW-206 **Pg. 2-12, p.4** - The second sentence in this paragraph is confusing. Does it imply that operation of the channel would be based on dam losses? If so, this is not acceptable to WDF. Any significant additional fish production at the channel beyond the present program would require additional space, and probably water. Also, adults produced by the channel are now fished on at a non-hatchery rate. We have no plans to alter this strategy because of additional mitigation requirements. If a natural self-sustaining run of chinook salmon is to be established in the upper Elwha, it will not be able to be harvested at a hatchery rate. This is true also for other salmonid species destined for restoration.

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SOW-202: A Ranney well installation has been recommended for mitigation if dams were removed (see Section 4.2.2.3).

SOW-203: The period has been changed (see Appendix A, Part 3.3 and Section 4.2.3.1.

SOW-204: The text has been changed in the Executive Summary; also see Sections 4.2.3.1 and 4.2.3.2.

SOW-205: Refer to response SOW-200. The EIS contains an information baseline (i.e., current environmental conditions), and it evaluates all alternatives against this baseline.

SOW-206: The text has been changed in Section 2.2. The exact wording of the applicant's proposal follows: "The ongoing mitigation already supported by James River (the Rearing Channel), could be adapted to be compatible with providing supplemental fish production to compensate for the unavoidable fish losses which will occur even with excellent passage facilities. James River suggests that artificial production be directed at those stocks which currently support a hatchery-based harvest. Although the level of artificial production should be based on dam passage losses of wild fish, direct hatchery replacement with the same stocks is not required. Through careful stock selection, conflict could be reduced between the stocks targeted for restoration which cannot be subjected to hatchery harvest rates, and the hatchery stocks which will continue to support commercial harvest" (James River II, June 5, 1990).

The staff's interpretation of the applicant's proposal does not include increasing production of the WDF rearing facility, but that the portion of the rearing channel production paid for currently by the applicant could be subject to consideration for changes in stock production or numbers of fish. While the Elwha River chinook are not harvested at hatchery stock rates, they support "hatchery based harvest," which means they could be considered for future rearing for the purposes proposed by the applicant. These stocks might or might not be considered appropriate for supplementing losses from passage. The resource agencies would have to decide in the future if the WDF rearing channel is compatible with restoration of a wild chinook stock in this system.

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Mike Palko
June 12, 1991
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SOW-207 **Pg. 2-13, p.4** - One hundred cfs spill would probably not be sufficient to attract and pass fish effectively. It is critical that adequate flow is maintained to "pull" fish through the reservoir to the dam for downstream passage.

Affected Environment

SOW-208 **P.3-1, p.2** - It should be noted that the water temperature regime has been altered by the two-dam complex. Elevated water temperatures in the lower river in late August, September, and October are caused by the heating of water behind the dams during the warm weather of summer.

SOW-209 **Pg.3-24, p.3** - This paragraph should be expanded by including data on chinook pre-spawning mortality due to warm water and disease. Instream pre-spawning mortality rates have ranged from 10 to 38 percent for the years 1986 to 1990.

SOW-210 **Pg. 3-26, p.2** - The statement that the Elwha River basin only produces a small percentage of historical numbers is not correct for chinook and probably coho salmon. For instance, the total (catch and escapement) chinook runs for the past five years have been estimated at 12,800, 23,600, 34,800, 22,800, and 14,400. These numbers of fish cannot be considered only a small percentage of the historical base and, in fact, may exceed it on three of the five above mentioned years.

SOW-211 **Pg.3-28, Table 3.5** - WDF believes that Table 3.5 and the estimates for certain species of salmon are somewhat over estimated. Spawning escapements for chinook and the total run size estimate for sockeye are too high.

SOW-212 **Pg. 3-29, last paragraph** - The chinook run to the Elwha River is more properly termed a summer variety rather than "fall". The majority of fish enter the lower river in July and August and spawn from late August to mid October. A better definition of the chinook run would be a summer stock with broad spawning timing.

SOW-213 **Pg.3-31, p.7** - This paragraph is somewhat misleading as it seems to indicate that fish are spawning in the WDF channel. They do not, the channel is used exclusively for rearing approximately three million juvenile chinook salmon annually. The 44 percent refers to the percentage of broodstock collected from the Elwha River itself. The other broodstock component is taken from fish that return to the adult trap located at the lower end of the channel.

SOW-214 **Pg.3-33, p.2** - The higher than normal redd density is an artifact of hatchery produced fish spawning naturally in the lower Elwha River. It has been estimated that about 75 percent of the spawning population is made up of hatchery origin fish. This is not unrealistic; similar percentages have been documented in other chinook spawning areas such as the Cowlitz and mid-Columbia Rivers.

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SOW-207: Additional flow is included in the staff recommendations (see Section 4.2.3.3).

SOW-208: Comment noted. This information is provided in Section 3.3.3.

SOW-209: The effects of disease are covered under individual species (Section 3.4.3).

SOW-210: The referenced section has been modified to reflect current FERC legal opinion on jurisdiction.

SOW-211: Comment noted.

SOW-212: The staff defined the stock as "summer/fall" (see Section 3.4.3.1) and then shortened the term to "fall" because there was not a compelling reason to use "summer," and management documents refer to the stock as "summer/fall," not "summer" (WDF et al. 1991). Additionally, Brannon and Hershberger (1984) in their discussion about the distribution of the Elwha River chinook stock referred to the stock as "fall." Using the term "fall" seems to be as appropriate as the term "summer." While the timing might most closely approximate summer timing, the staff does not believe the exact term used for the stock significantly changes the text discussion of the existing environment or impacts. Therefore, no changes in terminology will be made.

SOW-213: The text has been changed in Section 3.4.3.1.

SOW-214: The text has been changed in Section 3.4.3.1.

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SOW-215 Pg. 3-37, p.1 - The statement is made that "... the mainstem river slope is generally between one and two percent." This may be correct for the lower and middle reaches, but the upper reach generally exceeds three percent in slope.

Environmental Impacts

SOW-216 Pg. 4-66, Table 4-14 - This table needs to be updated; it does not provide the best estimates for salmon production from our information sources. For instance, present production of adult summer chinook is about 22,680/year (1986 - 1990 average). Other figures need modifying also.

SOW-217 Pg. 4-80, ps. 3 & 4 - The estimates for channel and terrace stability differ in these two paragraphs. The estimate is from four to ten years in the first paragraph and from four to six years in the second.

SOW-218 Pg. 4-85, top of page - Should read modifications to the "... fish rearing channel" instead of "... fisheries spawning channel."

SOW-219 Pg. 4-92, p.2 - The document states that "... filtration of water would not be economically feasible for the rearing channel. Off-site mitigation in the form of a rearing facility on a nearby river would be necessary to maintain fish stocks from the WDF facility..." WDF appreciates the fact that the document recognizes the need for mitigation if the rearing channel needs to be shut down, even temporarily. As stated earlier, the rearing channel has been producing large numbers of adult chinook salmon during the past five years. Approximately 75 percent of these fish are caught by the various commercial, recreational, and tribal fisheries in marine and freshwater areas. To remove these fish from the region's chinook salmon production base would cause a significant decline in the overall harvest of the state's most desired and valuable salmon species.

Unfortunately, mitigating for this large population of fish by going off-site and out-of-basin is not feasible at this time. A three million chinook production facility is not readily established in another watershed. The SEPA and permitting processes would take two to five years even if an appropriate and acceptable site could be found. A complicating factor might be harvest management problems created by moving this indigenous stock to another watershed. The best thing to do is to find some way to keep the present facility operating without curtailing production. Perhaps the water supply could be effectively filtered and high water quality maintained.

SOW-220 Pg. 4-95, p.2 - It should be noted that brood stock is taken from both the river and channel. About 44 percent of the egg-take comes from the river itself. If the river is highly turbid, it would make collecting brood stock from the river impossible and reduce the normal

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SOW-215: Actually less than 20 percent of the upper main stem has a slope in excess of 2 percent, and only 10 percent greater than 3 percent. The lower and middle reach is mostly 0.5 to 1.0 percent slope (James River 1988, Appendix 6, Table 4).

SOW-216: Table 4-17 has been modified.

SOW-217: The main channel would recover early, while the channel fringe and upland areas would take longer as the vegetation and slopes mature.

SOW-218: The text has been changed in Section 4.2.1.4.

SOW-219: The importance of the WDF fish rearing facility was recognized by the staff in Sections 3.4.2. and 3.4.3. Because of its importance in producing large numbers of chinook salmon, the staff has developed mitigation measures to allow for the continued operation of the WDF fish rearing facility during and after the dam removal period. This would be accomplished by obtaining water from subsurface Ranney collectors. This measure, and associated costs, are described in Appendix A.

SOW-220: The text has been changed in Section 4.2.3.1.

COMMENTS OF STATE OF WASHINGTON

SOW-220 cont'd egg-take and production program by approximately one-half. This potential problem would severely limit the channel's production program for an extended period of time.

SOW-221 **Pg. 4-134, Table 4-21** - This table needs to be modified relative to the potential and present production numbers. WDF believes that changes for chinook, coho, and pink salmon are in order.

SOW-222 **Pg. 4-143, p.2** - See comments for 4-92, p.2.

SOW-223 **Pg. 4-146, Table 4-23** - What is the source of these passage mortality figures? Are these figures based on actual study results from projects similar in nature? We are especially interested in how the 7.5 percent adult fall chinook and ten percent spring chinook loss rates were calculated.

Summary and Staff Conclusions:

SOW-224 **Pg. 5-9, p.3** - Increased bedload material that would raise the streambed by one to five feet would probably contaminate and/or inundate the spawning gravel beds and cause destabilization of the lower river spawning and rearing habitat. This could render the lower river useless for several years in terms of its natural production capability.

SOW-225 **Pg. 5-13, p.3** - The statement is made that "... commercial, tribal, and sport fisheries would benefit with removal of both dams more than any other alternative." Long term, this statement is probably correct; however, short-term impacts to the lower river and rearing channel could make the dam removal alternative less desirable. Once the lower river returns to its original condition and the rearing channel reopens or returns to full production, the dam removal proposal becomes the most desirable from a total salmon production standpoint. Initially, the dam retention proposal would probably have less impact on the lower river fish resources and, therefore, create the least harmful short-term effects. Minimization of lower river impacts would help make the dam removal proposal the best option for salmon in a relatively short period of time. The key is to limit or eliminate serious lower river fish impacts by employing state-of-the-art technology rather than expecting off-site mitigation to be the solution.

Sincerely,

Duane E. Phinney, Chief
Habitat Management Division

DEP:SG:jkd

RESPONSES TO STATE OF WASHINGTON

SOW-221: The table has been modified.

SOW-222: Refer to response SOW-219.

SOW-223: These numbers were based on studies done on the Columbia River and applied to a passage survival model for the Columbia River (NPPC 1989) (see Appendix B for details). The staff was unable to obtain any reliable numbers from any projects similar to the Elwha Project. Obviously because no studies could have been conducted on the Elwha, some assumptions were made about survival rates. The rates that were applied to the Columbia River System ranged from 5 to 10 percent mortality per dam plus each reservoir that is passed (NPPC 1989). Some species mortality would be at the high, medium, and low end of this range. Considering the Elwha has a fairly confined river region with small reservoirs to pass, these mortalities rates were conservative.

SOW-224: The short-term impacts (up to 4 to 6 years after removal) to spawning and other fisheries life stages are discussed in Section 4.2.3.1.

SOW-225: The text has been changed in Section 5.2.8.

DRAFT
STAFF REPORT

THE STEELHEAD SOCIETY OF BRITISH COLUMBIA

WASHINGTON CHAPTER

16430 72 West
Edmonds, Wa 98026

April 4, 1991

Chairman, Federal Energy
Regulatory Commission
825 North Capitol Street NE
Washington, DC 20426

Dear Chairman,

The Steelhead Society of British Columbia, Washington Branch (SSBC), welcomes the opportunity to comment on the draft environmental impact statement concerning the Elwha River dams. The SSBC, Washington Branch is a group of knowledgeable and experienced steelhead anglers who fish widely up and down the west coast of North America.

As you know from previous correspondence, the SSBC opposes strongly granting an original license and renewal license to the Elwha and Glines Canyon dams on the Elwha River on Washington's Olympic Peninsula. The SSBC supports enthusiastically removal of both dams and restoration of the Elwha River to its natural condition. We believe that the Commission has both an opportunity and obligation to provide access to the upper reaches of the Elwha to anadromous species by causing the removal of the Elwha and Glines Canyon dams.

You have the opportunity to restore the Elwha to something approximating its original condition so that the once numerous anadromous salmonid stocks can rebuild to historic levels providing sustenance, spiritual and material, to residents of this land. The Elwha is a unique river system with enormous fish production capability.

We believe you have an obligation to remove fish obstructions which were never properly licensed or were built with inadequate consideration of the environmental impact. As detailed in your studies, alternate power, at comparable SS-1 rates, is available to the current license holder thus there is not economic justification for continued operation of these fish blocking facilities. Furthermore, the cost of

SS-1: Comments noted. FERC uses current conditions (e.g., fish production levels) as a baseline against which to compare alternatives. Accordingly, gains in fish resources are viewed as benefits.

COMMENTS OF STEELHEAD SOCIETY OF B.C.

SS-1 cont'd lost fisheries caused by the dams should be included in economic calculations. The anadromous fish that the Elwha should be producing belong to the residents of this state and the nation at large. My organization would rather have the fish than the money. But in either case, the current license holder has no right to deny the rest of the citizenry an opportunity to enjoy the anadromous stocks which should be present in the Elwha and can be present if the dams are removed.

SS-2 The SSBC supports the conclusion that restoration of anadromous fish above the current dam sites is feasible only by removing the dams. Other alternatives simply do not work as can be seen on the Columbia and elsewhere. Therefore, the SSBC, Washington Branch urges the Commission to endorse and support the dam removal option.

Thank you for your time and attention.

Sincerely,

Pete Soverel
Chairman

COMMENT OF STEELHEAD SOCIETY OF B.C.

SS-2: Position in favor of dam removal is noted.

6855 -17th Ave. N.E.
Seattle, WA 98115-6844
April 4, 1991

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol St. N.E.
Washington, DC 20426

Dear Ms. Cashell:

The opportunity to remove the dams on the Elwha River on the Olympic Peninsula in Washington State is such an important issue that I must write to you with my reasons for encouraging this to happen.

There really are no good reasons for keeping the dams. The Lower Elwha Dam was built in 1911-14 in violation of state law, with no provision for fish passage. The Glines Canyon Dam was built in 1926-27, also with no fish bypass.

Having read in the newspapers very recently about the endangerment of the salmon, it seems imperative NOW to remove the dams. Environmental and conservation groups have been pushing this action for years, and the reasons are abundantly clear.

1) We must restore the fish runs, and that can't be done with the dams in place. The prospects are very good for restoring these runs if the dams are removed; in fact, the Draft Environmental Impact Statement feels that the chances are good to excellent.

2) The dams are getting very old. They will need costly repairs. They shouldn't be there in the first place, so why throw good money after bad?

3) Right now the Daishowa Company, which runs the pulp mill in Port Angeles, is getting electricity at very low rates from these dams, which I and others have said shouldn't be there. Because the dams are old, they'll need expensive repair work done on them - which means that some of these costs will be passed on to the Daishowa Company. So they will be no better off in the future than if they explore other means of getting electricity. Experts have said that conservation and co-generation will supply power just as cheaply as hydroelectric dams.

4) The possibility of heavy deposits of silt formed behind the dams ruining the river permanently seems to be a remote one, according to the DEIS. The effects would not be long-term.

5) All my life I've dreamed of undoing some of the rape of the land that has occurred. This is the first time I've seen such an opportunity. We can't miss it now. Our future depends on it too much!

Very sincerely,

Alice B. Nugent

cc: Adams
Gorton
McDermott
Gardner

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UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

Institute for Environmental Studies
Engineering Annex, FM-12
(206) 543-1812

June 10, 1991

Federal Regulatory Commission
Office of Hydropower Licensing
825 North Capitol Street, NE
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UW-1 We are submitting the attached report as a written response to the February 1991 Environmental Impact Statement in support of removal of both the Elwha and Glines Canyon Dams. The report is a written review of the political and socioeconomic considerations outlined in the DEIS and other sources. Thank you for considering this report in the final EIS.

Sincerely,

Lynette Stevens

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UW-1: The very thoughtful and well-written comments are noted, as is the position favor of dam removal.

The DEIS contains far more than 10 pages devoted to the issue of anadromou fisheries restoration alone, which is one of the central issues involving the Klallam and the Treaty of Point No Point. The socioeconomics and cultural resources sections of the DEIS also discuss Native American issues and the economic and cultural implications of dam removal and fisheries restoration i sufficient detail for an EIS.

See also responses DOI-226, CI-17, and CI-24.

Comment noted. No reliable pre-dam estimate of what the run sizes would ha been has been developed. The staff does not think the statement about the current run size of chinook from the hatcheries compared to historical runs be "minuscule" is valid. Although no reliable estimates of past runs are available, the staff estimates suggest that at times chinook runs from the current rearing channel might equal those that would have been produced historically under th current harvest regime.

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THE ELWHA AND GLINES CANYON PROJECTS.

THE POLITICS OF HYDROELECTRIC POWER

Presented by:

Lynette Stevens
Spring 1991
Envs 206
Final Project

The Politics of Hydroelectric Power

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The Elwha and Glines Canyon Projects:
The Politics of Hydroelectric Power

For decades people in the Northwest have enjoyed cheap electricity often at the expense of the ecosystem. Due to the illegal construction of the Elwha and Glines Canyon dams, the historical salmon runs of the Elwha River have practically reached extinction. Removal of the Elwha and Glines Canyon dams combined with long-range planning will provide Washington state an opportunity to restore these historic anadromous fish runs. I intend to show how political favors, short term thinking and irrational fears continue to set a precedent for the cycle of destruction of the Elwha River Basin and Olympic Natural Park.

The Elwha dam, financed by a Chicago investment bank, was developed about 5 miles from the mouth of the Elwha River by the Olympic Power Company from 1911 to 1913. Due to a dam failure in 1916, the dam assets were acquired by Northwest Power and Manufacturer Corporation. The company became Northwest Power and Light, a subsidiary of Crown Zellerbach Corporation, in 1924. In 1968, Crown Zellerbach Corp. filed for the original license for the dam. They updated their filing in 1979 as required by the Federal Regulatory Commission. In 1987, Crown Zellerbach changed their name to James River II, which is a subsidiary of Virginia based James River Corporation (FERC, 1991).

The Federal Power Commission (FPC) granted permission for the construction of the Glines Canyon dam seven miles further upstream from the Elwha Dam in 1926 by the Northwest Power and Light Company (FERC, 1991). In 1934 the dam was transferred to Washington Pulp and Paper corporation. Both are subsidiaries of Crown Zellerbach. The Glines Canyon Dam was not within the boundaries of Olympic National Park during its Congressional designation in 1938. President Roosevelt extended the park's boundary in 1940 to include the Glines Canyon dam. In 1975, Crown Zellerbach filed an application to renew their license. The notice of application came through in [illegible] Crown Zellerbach changed their name to James River II in 1987, the subsidiary of James River Corporation (FERC, 1991).

The [illegible] Area of Potential Effects includes two historical sites. Both the [illegible] and Glines Canyon dams were submitted into the National Register of Historic [illegible] the Elwha River plant as an example of early 20th century buttress dam and the Glines Canyon project as a mark of the end of single purpose hydroelectric installations. This registration may have been a political maneuver on behalf of James River and Daishowa America to protect the dams from removal.

The primary attribute to the pristine Elwha River, the largest north flowing river in the Olympic Peninsula, was its historical anadromous fish runs (Dyer, personal communication 1991). Neither of the dams have any fish ladders in direct violation of [illegible] passed in the 1890's. Consequently, the anadromous fish spawning runs [illegible] been reduced from 43 miles upstream to 4.9 miles downstream of the the Elwha dam (FERC, 1991). Before the dams, the Elwha river supported sizable runs of every species of Pacific salmon located in North America, with pink salmon, the most numerous, averaging 275,000 every other year (Brown, 1982)(see Appendix A). The large, long lived Chinook salmon frequenting these waters were said to weigh between 50 and 100 pounds. The Department of Fisheries calculated the monetary loss of the Elwha River Basin salmon runs to be $500,000 annual, totaling $35 million from 1912 to 1982 (Brown, 1982).

Olympic National Park was designated an International Biosphere Reserve in 1976 and a World Heritage Site in 1981 (Olympic Parks Associates, 1991). Among other habitats, the Olympic Natural Park contains the Hoh Rainforest, a lowland temperate rainforest unique to North America. Full restoration of Olympic National Park depends in part upon restoration of the anadromous fish runs due to additional biomass of salmon carcasses for wildlife to consume (FERC, 1991). Twenty-four mammal and bird species residing in the Olympics are known to consume salmon carcasses (see Appendix B). Loss of anadromous fish appears to be a significant factor in limiting bald eagle use of the middle and upper regions of the Elwha River (FERC, 1991). Successful reservoir drainage and revegetation could provide an opportunity for migratory lowland wildlife habitat as well as providing an increase in the number of habitat units for many terrestrial animals (see Appendix C).

Together, the Glines Canyon and Elwha dams provide electricity solely to a pulp processing mill which was also owned by James River II. They supply only an average of 19 megawatts annual yield (or 172 GWh) of electrical energy which constitutes only about 40% of the mill's energy needs. James River II has already sold the mill to Daishowa America, one of the largest pulpmill operators in the world, but James River II still holds the titles to the dams. The sale of the dams to Daishowa America is contingent upon the renewal of the license by the Federal Energy Regulatory Commission (FERC, 1991).

[illegible] the Glines Canyon and Elwha dams in jurisdiction [illegible] James River II is applying for a renewal of the Glines Canyon license while [illegible] for [illegible] license for the Elwha Dam. The Glines Canyon dam license [illegible] licenses are only valid for a term of up to

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fifty years. The 1969 National Environmental Policy Act makes it law for the public to have access to the Draft Environmental Impact Statement (DEIS) which outlines the possible effects on the environment from the renewal or original issuance of hydroelectric licenses. The Federal Water Power Act of 1920 requires dams to "enhance fish and wildlife." Any person can file a complaint with the Federal Energy Regulatory Commission for a dam's non-compliance with enhancement of fish and wildlife. A 1934 amendment to the Federal Water Power Act also made it illegal for the Federal Energy Regulatory Commission (FERC) to issue a license for new hydroelectric projects within the boundaries of a national park. The problem with this amendment is that it does not outline what to do in a case such as the Glines Canyon dam when the dam is built before the national park boundaries are set to enclose it (FERC 1991).

Intervention started when Dr. Ric Rutz of the Audubon Society realized that the Glines Canyon dam was breaking the Federal Water Power Act amendment by being located in a national park (Dyer, personal communication, 1991). He brought this awareness to the Sierra Club, Olympic Park Associates, the Audubon Society, and Friends of the Earth. In 1988, together with the Audubon Society, these organizations filed an intervention for removal of both dams with the Federal Energy Regulatory Commission claiming the FERC does not have the jurisdiction to renew the Glines Canyon dam license (see Appendix D). The National Marine Fisheries, United State Fish and Wildlife, and the National Park Service, all under the Department of the Interior, also intervened on behalf of removal of the dams. Washington state Congressmen Brock Adams and John Miller submitted public statements at a DEIS hearing. Congressman Jim McDermott has also publicly called for the removal of the dams stating the removal of the dams presents Washington with a chance to reverse the declining wild salmon runs (McDermott, 1991). The Washington Wilderness Coalition, Mountaineers and the Steelhead Committee of the Federation of Fly Fishers also submitted written statements.

On the other side of the issue stands Japanese owned Daishowa America, one of the largest pulp mill operators and union in the world. As a sidenote, Ryoei Saito, the [illegible] been implicated in the unscrupulous purchase of an $82 [illegible] the transfer of millions of dollars or evade taxes [illegible] already submitted in a [illegible] by Washington Department of Ecology [illegible] percent of required energy [illegible] to little power (FERC, 1991; James River [illegible]

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attorneys from Perkins Coie, a Bellevue law firm, have asked and been granted a 60 day extension of the DEIS comment period. They contend the DEIS does not adequately cover the sediment release issue and the affects on water quality if the dams are to be removed (Perkins Coie, 1991).

The Secretary of Energy submitted a Notice of Intervention on behalf of retention of the dams in accordance with section 405 of the Department of Energy Act. The U.S. Secretary of Energy opposes removal because he contends every kilowatt available in this country is needed to make the United States energy independent (Dyer, personal communication, 1991). The Secretary feels revitalization of the hydropower industry is one of the keys to national energy self-suffiency, so he fears this case may set a precedent for the demise of the hydropower industry (Department of Energy, 1991). Is selling our environment and electricity to a Japanese owned corporation making us "energy independent?!" Doubtful. There is some speculation that the Bonneville Power Administration agency within the Department of Energy influenced this intervention because Bonneville is not willing to supply the mill any more power in the event of dam removal (Bonneville currently supplies 30-40% of the mill's energy needs)(de Yonge, personal communication, 1991). The majority of the people in Port Angeles are also for continuing operation of the hydroelectric projects because of the mill's contribution to their economy. Many also fear the temporary reduction in their water quality during and immediately following dam removal. If the people of Port Angeles could have their fears and needs satisfied by a guarantee of replacement of the lost electricity due to removal, they would most likely be for removal because it would eventually enhance surrounding natural beauty and attract more tourism.

Al Swift, the District Representative for the area involving the Elwha River, has made no public statement for removal or retention of the dams. He is trying to satisfy the people who want removal of the dams while keeping the votes of Daishowa America employees so he can stay in office. Although Representative Swift is not taking a position, John Miller feels Al Swift is doing an excellent job of bringing all involved parties together to resolve these issues(Miller, 1991)

The Washington Department of Fisheries has yet to take a stand on the issue either. Until the 1980s they paid no attention to the dam because "business speaks" and the mill owners were considered to be mitigating because they have been providing the Washington Department of Fisheries with funds to operate a fish hatchery at the end of the dam (de Yonge, personal communication, 1991). This fish rearing hatchery historically has had many problems and is relatively unsuccessful in

generating even a minute percentage of the natural runs that used to occur in the Elwha River.

The Washington Department of Fisheries contribution to the problem began in 1912 due to poor appointing of fish commissioners since the very beginning. Often the appointments are merely political favor and the appointees know little or nothing about fisheries. Ernest Lister, the elected governor of Washington in 1912, appointed fish commissioner Leslie Darwin (Brown, 1982). Darwin was very concerned with the wastage of fish and gross profiteering associated with the salmon cannery industry centered in Bellingham. He attacked the canneries on their historically illegal tax evasion practices while aggressively demanding smaller dams on Elwha tributaries equip themselves with fish ladders. Due to the influential Olympic Power Company backers and governor Lister's personal infatuation with hydroelectric power, Darwin opted for a more "entrepreneurial" solution to the Elwha dam's problem of no fish ladder. In August of 1913, Darwin proposed to Aldwell, the president of Olympic Power, that Aldwell finance the building of a hatchery in lieu of a fish ladder. Salmon propagation in these artificial environments was scientifically unproven at this time. When Darwin proposed the alternative more forcefully in August of 1914, Olympic Power donated the land and $2,500 to partially fund the hatchery's construction. This deal was illegal because by law, the dam should have been removed at this time at the owners expense because the dam had already been in violation of the law for five years! Governor Lister convinced the legislature that hatcheries were an acceptable substitute for fish passages, and Darwin accepted hatcheries over fish ladders on seven other dams throughout the state (Brown, 1982). The tragedy of this original illegal deal between Aldwell and Darwin is the precedent it set to accept untested mitigation efforts and the far reaching effects these dams with no ladders have had on the anadromous fish species as a whole all over Washington. Now, the mill owner's continued funding puts the Washington Department of Fisheries in a "conflict of interest situation" (de Yonge, personal communication, 1991).

The DEIS, prepared by a private consulting firm for the FERC, outlines four [illegible] scenarios for these two dams: retention of both, removal of both, retention of the [illegible] with removal of the Elwha, and retention of the Elwha with removal of the [illegible]. The executive summary of the DEIS states three relatively mutually exclusive [illegible]:

Restoration of [illegible], self-sustained runs of anadromous fish.
Restoration of natural conditions of Olympic National Park.
Provisions of renewable hydroelectric energy.

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Included in any of the retention options is the requirement for Daishowa America to construct fish ladders on both dams. Winter Steelhead trout, Chinook and coho salmon [illegible] are the only species to benefit from fish ladders. With retention of the dams the reservoirs will continue to store sediments and woody debris from upstream [illegible] to poor fish habitat. Olympic National Park would only partially be restored because the three anadromous fish mention above would only make it to Lake Mills in low numbers due to passage mortality. The socioeconomic value to the Elwha Tribe would be minimal because of harvest constrictions. Recreation [illegible] would be lessened during construction of the fish ladders.

Removal of both dams is proposed over a five year period, with an additional [illegible] to five years for sediment stabilization. This precludes any dredging and disposal. Aquatic resources would be severely impacted during the removal due to suspended load. Anadromous fish restoration measures could not commence during this time. The river would be restored to its natural habitat in 10 - 20 years after removal. The mill would experience a negative economic impact due to the loss of 40% cheap electricity.

Socioeconomic considerations are central to the decision of removal or retention of these dams. Port Angeles and the Klallam Tribe's economies are largely based on natural resources. Causing a "sunshine belt" effect, the Olympic mountains shield Port Angeles, Sequim and neighboring areas from heavy storms (de Yonge, personal communication, 1991). Thirty two percent of the county's population resides in Port Angeles, two percent in the Klallam tribe and fifty-seven percent are unincorporated with this area projected to have the most growth. In 1987, 66% of the county's population was employed in manufacturing related to timber, tourism generated 1,650 jobs and 175 million annually, while commercial and sports fishing constituted the [illegible] of employment. The 1986 per capita income of $11,545 was 12% [illegible] at that time. The total population of the county is projected to [illegible] in the year 2000 with much of the population [illegible] 65 years old (EPRC, 1991). This increasing median age will lessen ties to the timber industry and strengthen ties to natural beauty and tourism. Retail, [illegible] sectors will [illegible] due to tourism and the [illegible]

[illegible]

[illegible] the tribe's population exceeded [illegible] people (FERC, 1991).

The Klallam tribe ceded this territory in the lower Elwha to the U.S. Government by the "Treaty of Point No Point of 1855" (FERC, 1991). Under this treaty, the tribe and other signors were granted the right to half of the harvested catch of anadromous fish. A provision in the treaty proposed to relocated the tribe to the Skykomish reservation at the south end of Hood canal. Few of the tribesmen actually relocated because this reservation was too far from their traditional home and too close to the Twanas, a rival tribe. In a 1892 Federal Fisheries report, 360 of 367 commercial fishermen in Clallam county were Native American. In 1936, the US purchased land in the lower Elwha region and the "Lower Elwha Reservation" was officially established by the Nixon administration in 1968. The population of the Klallam tribe [illegible] less than half the population before Euro-American contact. Smallpox and other introduced diseases decimated their population (FERC, 1991).

James River II has conducted surveys along the shorelines of Lake Mills, Lake Aldwell, and the Elwha River shore to search for prehistoric archaeological sites. They have not found any which is not too surprising because the most likely place for to find prehistoric artifacts is near river bottoms under the high sediment loads of dam created Lake Mills and Lake Aldwell. The Klallam tribe has been unable to conclusively identify any Native American heritage sights either in the project Area of Potential Effects under consideration probably solely due to the lack of funds to conduct a expensive survey like James River's survey. The Klallam "Center of the Universe Story" is located within Lake Aldwell and they believe there to be petroglyphs and artifacts under the lake sediment. Since their is no proof, the area is not considered a Native American Heritage Site (FERC, 1991).

The Klallam tribe contends the construction of the Elwha dam is a violation of the "Treaty of Point No Point of 1855" because the dam disrupts the natural ecological [illegible] of the anadromous fish which directly disrupts the Klallam society and culture [illegible] a 1912 failure of the Elwha dam flooded their tribal lands. Also [illegible] from the dam threatens the safety [illegible] to mention damage and/or loss of equipment (FERC, 1991). The [illegible] been required by law to compensate the tribe for the [illegible]

[illegible]

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[illegible] the tribe['s] [illegible] culture [illegible]. In [illegible] [Elwha] River [illegible] the tribe [illegible] [emphasizing] [illegible] [relationship] [illegible] the fisheries as a [illegible] [for] [illegible] 1974 US Court versus [Washington] [illegible] case, known as the "Judge Bolt decision", upheld the tribe fishing rights [illegible] in the original treaty. The Bureau of Indian Affairs regards these rights as equal to property rights. In response to the DEIS, the Klallam tribe calls for [restoration] of fish and shellfish as a partial restoration measure for their culture as [well as] the [fish harvest] [illegible] as required under the "Treaty of Point No Point" (FERC, [illegible]).

If the [dams] are to be removed, Daishowa America must find a way to replace [illegible] source. Daishowa America spokesman Bob Hartley has commented that [Daishowa] America will wait for the outcome of the license proceedings before seeking [alternative] energy sources (Lange, 1991). This "[don]'t do anything until we have to" [approach] shows Daishowa America's non-commitment to finding environmentally [sound] long-term solutions until they are required. The most sensible source of this needed power would be through conservation efforts. If the citizens of Port Angeles feel they need a guarantee of an additional source of power in the event of dam removal, they need to be willing to conserve. Conservation is considered by many to be the key resource for meeting the Northwest's future electrical needs (Miller, 1991). Conservation, being uniquely flexible, can match growth demands at a particular time and can be developed much more quickly than generating new resources. Most reduction efforts need to concentrate on the generation, transmission, and distribution of electricity. The four sectors targeted for conservation are residential, commercial, industrial and agricultural (see Appendix G).

The Northwest Power Planning Council projects sixty percent of conserved electricity in the residential sector can come from reducing the amount to heat homes ([illegible]). [Zone] heating, improved insulation, and reducing air leaks can reduce [illegible] [environmental] [concerns] [illegible] [illegible]

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[illegible] than that amount [illegible] conservation [illegible] agricultural electrical [illegible] of total [illegible] energy demand [illegible]

[illegible] the sequential production of electrical and thermal energy, is a feasible resource option for Daishowa America. Nine hundred megawatts of [illegible] in the wood and paper industry, already exists in the region [illegible] of wood-waste fuel boiler size constraints and the availability of wood-waste fuel. Daishowa America's mill cogeneration potential would be limited to around 15 megawatts (FERC, 1991).

Coal-fired powerplants with an average of 3,154 megawatts capability constitutes a very feasible solution for Daishowa America. Proven reserves of low-sulfur coal are available near the region in abundance. Obvious problems with switching to coal-generated power includes increased air pollution and increased [illegible] of states like Montana and parts of Western Washington to reach these coal reserves. Controversial nuclear generation could provide 1200 megawatts a year, or about 60 times the amount of electrical energy the Elwha and Glines Canyons dams produce together (de Yonge, personal communication, 1991).

With the Draft Environmental Impact Statement completed, FERC must now by law take into consideration the written statements presented through the public hearings. With this information, FERC will write the final EIS stating what is to be done with the dams. This process will take at least another year. If decided upon, dam removal is not projected to start for possibly another five years due to "red tape" ([illegible] personal communication, 1991). Although the DEIS is presumed to be unbiased [illegible] of FERC supporting removal of the dams over retention. Although the Department of Energy's retention statement was made, FERC and Department of Energy operate independently so the statement by the Department of Energy may not have much impact (de Yonge, personal communication, 1991). Also, the Department of Energy and Department of the Interior historically have conflicting opinions on land [illegible] because the Department of Energy has never been known to be [illegible] and conscious.

[illegible] both the dams is the only realistic and effective long-term solution [illegible]

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[illegible] dam removals show recover of salmon runs and water quality within a relatively short amount of time when considering the average human lifetime. Our [illegible] faulty mitigation, political favors, and short-term thinking for [illegible] end. The salmon, the Klallam Tribe, Olympic National Park, and the people of Washington state have suffered long enough from the deliberate decimation of wildlife for the profit of first a Virginia-based firm and now a Japanese-owned firm.

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[illegible]

[illegible]

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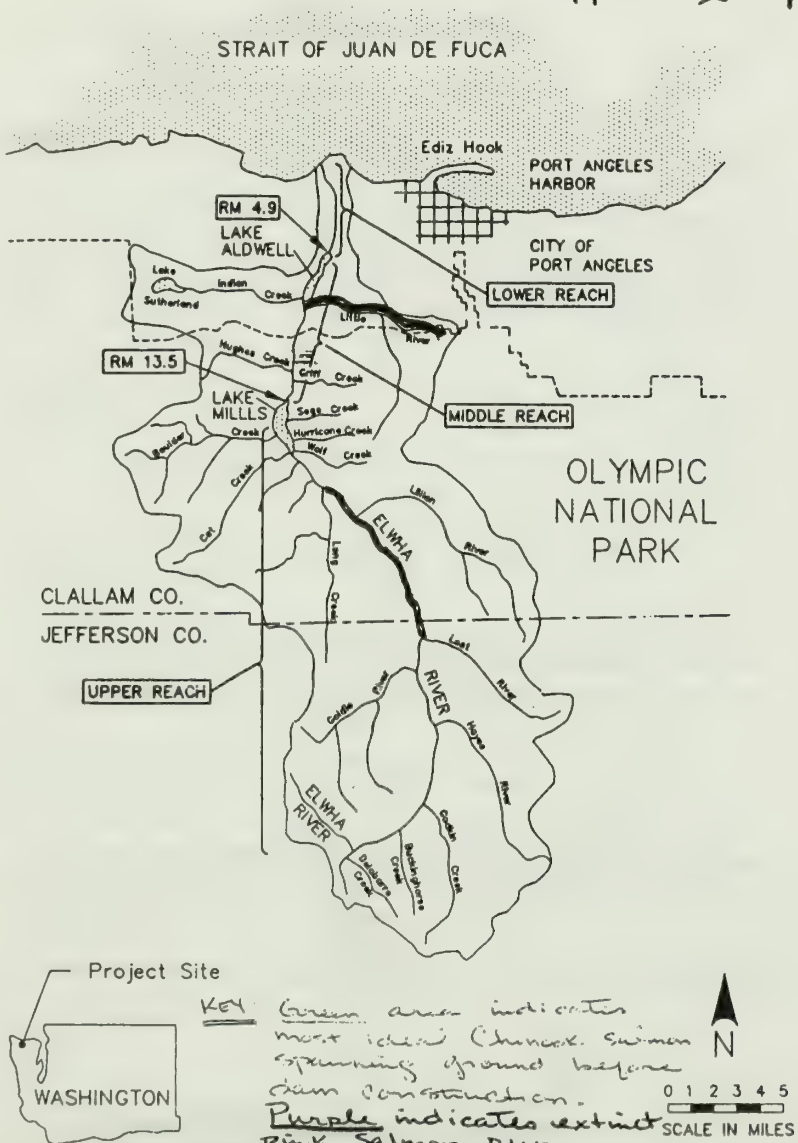
Appendix H



KEY: Green area indicates most ideal Chinook Salmon spawning ground before dam construction.
Purple indicates extinct Pink Salmon run.

Figure 3-2. Three reaches of the Elwha River. (Source: the staff).

3-3

Source: FERC, February 1991, DEIS, Division of

APPENDIX B

Table 4-11. Mammals and birds known to consume salmon carcasses (Source: Cederholm et al. 1989).

Mammals	Birds
Small and Medium Size	Raptors
Water shrew	Red-tailed hawk
Masked shrew	Bald eagle
Wandering shrew	
Mountain beaver	Nongame
Douglas-squirrel	
Northern flying squirrel	Dipper
Deer mouse	Stellar's jay
	Gray jay
Furbearers	Common raven
	Common crow
Raccoon	Northwestern crow
Weasel	Winter wren
Mink	
River otter	
Skunk	
Bobcat	
Large Mammals	
Black bear	
Coyote	

Source: FERC, February 1991, DEIS, Division of Public Information, Washington, D.C.

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APPENDIX C

Table 4-19. Average annual habitat units in the terrestrial study area for removal of both dams (Source: the staff, modified from James River II, 1988a, 1990i).

Evaluation Species	AAHU's Without Both Dams1/	AAHU's With Both Dams2/	Net Gain in AAHU's due to Dam Removal
Pileated woodpecker	941	635	306
Yellow warbler	16	12	4
Cooper's hawk	839	747	92
Mink (palustrine)	47	49	2
Mink (lacustrine)	0	186	(186)
Mink (riverine)	263	95	168
Beaver	127	99	28
Roosevelt elk	593	513	80
Black-tailed deer	773	648	125
Lesser scaup	0	40	(40)
Douglas squirrel	1,689	1,345	344

1/ Represents AAHU's ultimately expected with dam removal, based on pre-project conditions.

2/ Represents AAHU's in the terrestrial study area under current conditions.

Source: FERC, February 1991, DEIS, Division of Public Information, Washington, D.C.

APPENDIX D

INTERVENTION

FOR REMOVAL:	FOR RETENTION:
Autubon Society Sierra Club Olympic Park Associates Friends of the Earth	James River II
National Marine Fisheries U.S. Fish and Wildlife National Park Service	Daishowa America
Klallam Tribe	Secretary of Energy (Bonneville Power)
Washington Wilderness Coalition Mountaineers Federation of Fly Fishers	
John Miller Jim McDermott Brock Adams	Port Angeles

FENCE RIDERS:

Al Swift
Dan Evans

Washington State Department of Fisheries

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Appendix E

Some Big Japanese Art Purchases Are Under Scrutiny for Scandal

By JAMES STERNGOLD
Special to The New York Times

TOKYO, April 22 — Japanese art buyers have captured the world's attention in recent years, as they snapped up a long list of van Gogh's, Picasso's and other paintings by world masters. Many of those purchases were used to establish new collections or fill out old ones, and some of them now hang in public galleries around Japan.

Now, however, attention has turned to a little-noticed corner of that market in which large Japanese corporations apparently bought paintings, not with the intention of investing in fine art, but of using the purchases either to conceal transfers of millions of dollars in cash or to evade taxes. In an economy that is heavily taxed and hemmed in by regulation, experts say, the purchase and sale of multimillion-dollar paintings provided a handy dodge.

A Way to Move Money

"It was well known that art has commonly been used to hide money or secretly move it in the past few years," commented Nobuo Abe, chief curator at the Bridgestone Museum of Art in Tokyo, who said he had heard of many such cases.

To date, no wrongdoing has been proved, nor have there been any indictments. Still, the art world has been riveted by the tales of mysterious art capers that have unfolded in the Japanese press.

What is still unclear is how much — if at all — the disclosures about these deals will affect the high prices paid for sought-after paintings, prices driven up in large part by extensive Japanese buying. Japanese individuals and companies have been the buyers in 5 of the 10 highest-priced art transactions, led by the $83 million purchase last year of van Gogh's "Portrait of Dr. Gachet." The buyer was a Japanese industrialist, Ryoei Saito, owner of the Daishowa Paper Manufacturing Company.

Most of these purchases were public transactions at well-known auction houses like Sotheby's and Christie's. But many of the dealings that are now considered questionable were handled away from the light of public auction.

Now some art experts fear that scores of paintings involved in the financial wizardry could suddenly reappear on the art market, depressing the soaring prices of recent years.

"Nobody wants to buy paintings from Itoman, because they are tainted," said Kazuo Fujii, owner of a prominent art gallery here, referring to paintings held by one of the compa-

Continued on Page C19, Column 1

Source New York Times, April 22, 1991.

Appendix L

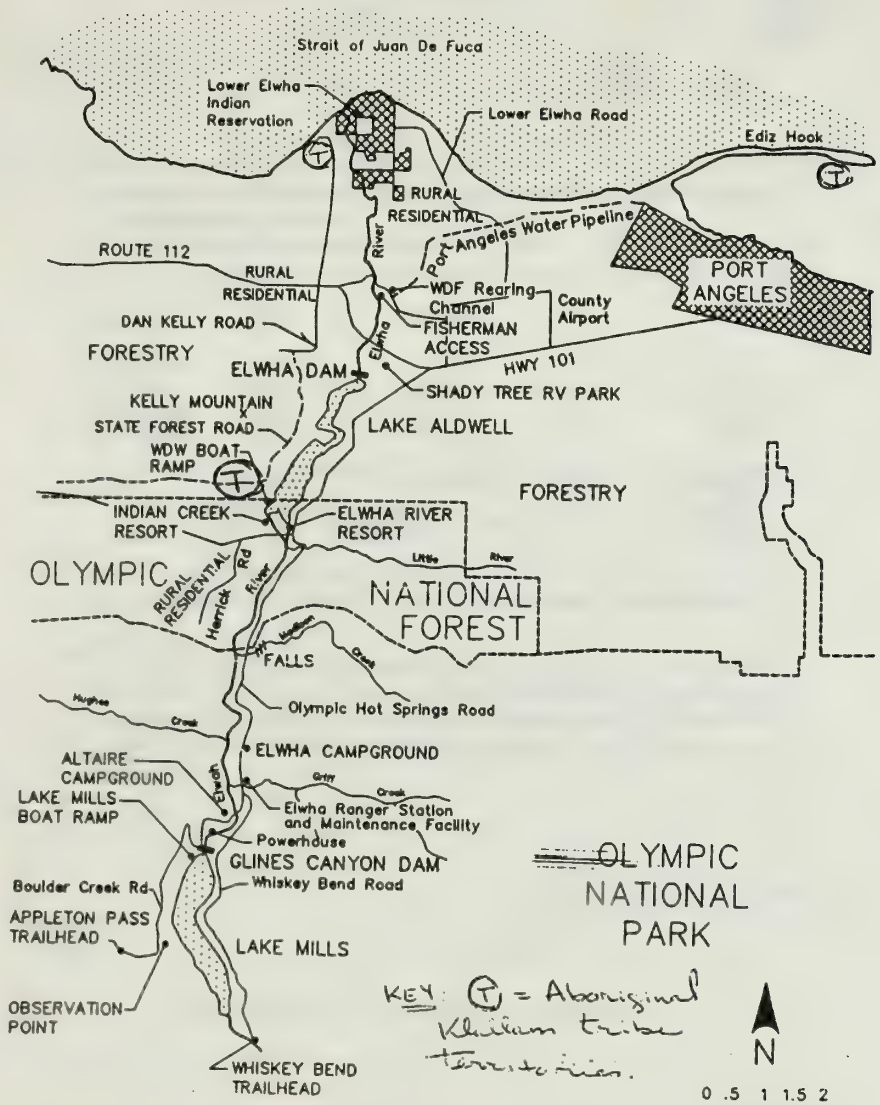

Figure 3-15. Generalized land uses in the project vicinity. (Source: the staff).

3-74

Source: FERC, February 1991, DEIS, Division of Public Information, Washington, D.C.

DRAFT STAFF REPORT

APPENDIX G

Table 8-1 presents a summary by sector of forecasted demand and planned conservation projected by the Council in its high-growth forecast. Conservation resources in the Council's plan reduce the projected overall demand for electricity by 8 percent from the demand levels associated with existing electrical energy use efficiencies.

Table 8-1. Summary of projected demand and conservation in the high forecast in 2010[1] (average MW[2]).

	Demand in 2010			Conservation
Sector	With current efficiencies	With plan's conservation	Percent savings	included in Council's plan
Residential	10,380	9,350	10	1,030
Commercial	7,880	6,890	13	990
Industrial	10,750	10,470	3	280
Agricultural	625	550	12	75
TOTAL [3]	29,635	27,260	8	2,375

[1] Source: Northwest Power Planning Council, 1989b.
[2] Does not include line losses.
[3] Excludes the category termed "other," which is a demand of 219 average MW.

Source: FERC, February 1991, DEIS, Division of Public Information, Washington, D.C.

OLYMPIC MOUNTAINS
WILDERNESS
ALPINE CLUB

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 N Capitol St NE
Washington, DC 20426

Dear Ms Cashell:

These are comments on the Draft Environmental Impact Statement for the Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects, Washington.

WAC-1

We are pleased to note that the Draft Environmental Impact Statement (DEIS) states that the best way to insure the restoration of the anadromous fish runs is removal of the dams.

We are encouraged by the opportunity the DEIS presents for helping to restore our Pacific Northwest salmon runs and the ecosystem within Olympic National Park and yet do so in a way that also preserves economic opportunities for the local community.

WAC-2

How much are salmon runs and a national park worth? The DEIS makes it clear this is the bottom line.

The jobs in the Daishowa America pulp mill and economic security for Port Angeles generally are not at stake here. When forecasting the cost of power for the mill, the DEIS concludes that generation from the dams will rise to equal the expense of electricity delivered by Bonneville Power Administration (BPA) at prevailing market rates. We believe that when the proper analysis is completed in the final document, the forecast will show higher costs for power from the dams than for BPA electricity. The DEIS fairly accurately projects future BPA rates, the document underestimates the future operation and maintenance (O&M) costs as well as the expense of fish by pass measures for the dams under a new operating license. Both the dams are old and O&M costs should rise just due to the fact they are so old. As a matter of fact, we believe dam removal would produce more construction and long term jobs than dam retention would.

WAC-3

Environmental groups have identified opportunities at the [illegible] America mill [illegible] megawatts of cost effective energy efficiencies, that is power supply cheaper than the output of the dams. [illegible] BPA [illegible] according to a letter from the agency to Representative Al Swift. In addition the

RESPONSES TO WILDERNESS ALPINE CLUB

WAC-1: Position in favor of dam removal is noted.

WAC-2: Operation and maintenance (O&M) cost estimates have been revised, and costs for staff-recommended measures have been accounted for. O&M costs are projected to rise with the rate of inflation; repair and replacement costs are addressed separately.

WAC-3: The referenced findings are inconsistent with an energy audit of the mill conducted in 1991.

COMMENTS OF WILDERNESS ALPINE CLUB

[illegible] June 91
[illegible]
page 2 of 2

WAC-3 cont'd potential for [illegible] effect [illegible] generational [illegible] at the mill

WAC-4 We fail to understand the concern about water quality. [illegible] the majority of the sediment in the Elwha River is glacial flour which rarely sinks, look at the river now gravel and rocks. Also the Elwha runs dirty [illegible]

WAC-5 In the DEIS it is made clear why a full restoration of the fish runs is so vital. The DEIS shows that due to the dam's blockage of the fish passage upstream and gravel migration downstream the pink salmon have dwindled to a small handful at the brink of extinction. The document incorrectly forecasts a remnant run if the dams remain, when in fact the native pink salmon of the Elwha will disappear forever when the last remaining spawning gravels wash out to sea. The DEIS correctly notes, dam removal gives us an excellent opportunity to restore the pinks to their earlier numbers. Also too the other fish ruins and with them, the entire watershed ecosystem which lies mainly within an International Biosphere, "Olympic National Park", one of our nation's jewels.

The reality is that one of the dams has been operating illegally since its inception and that other is located within Olympic National Park boundaries should make quite clear and simple the decision for dam removal.

We support the removal of both dams as the best alternative to restore the fish runs and the ecosystem of the Elwha River basin to its natural state

Sincerely

H. E. Wilson

H. E. Wilson
Conservation [illegible]
[illegible] Wilderness Alpine Club
[illegible]
[illegible]

RESPONSES TO WILDERNESS ALPINE CLUB

WAC-4: Comment noted. Water quality is a major concern addressed in Sections 4.2.2.1 and 4.2.2.2 because of potential adverse impacts to fisheries and water users under the dam removal alternatives. Turbidity values would periodically reach levels many times higher than currently existing for a number of years following dam removal. However, the staff recognizes that natural turbidity levels of the Elwha River, like other rivers running through glacial deposits, can attain relatively high levels.

WAC-5: The staff acknowledges that pink salmon might disappear in the future, but the current low run levels are not caused by gravel shortages (see responses DOI-65 and DOI-234). There is a supply of gravel to the lower river from the adjacent banks, so total loss of gravel is not likely to occur in the foreseeable future.

ASSOCIATION·OF·WESTERN·PULP·AND·PAPER·WORKERS
A Union for Today... and Tomorrow
1430 S W Clay · P.O. Box 4566 · Portland, Oregon 97208 4566 Phone (503) 228 7486

June 4, 1991

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol St., N. E.
Washington, D. C. 20426

RE: Glines Canyon Project No.588
and
Elwha Project No. 2683

Dear Secretary Cashell:

On August 7, 1987, the Association of Western Pulp and Paper Workers (hereinafter AWPPW) filed a motion as a late intervenor in the above-stated subject matter. We had originally petitioned for such matter in December, 1986, but were not given status at that time owing to our failure to comply with the established requirements to serve notice on the recognized parties. However, when we re-submitted our petition in 1987, we included our 1986 draft. On September 15, 1987 our motion was acknowledged, and we have subsequently received most, if not all, of the documentation that has surfaced over the issue of relicensing the two projects.

WPP-1 Our primary objective in submitting our petition to intervene centered around our authority as the certified bargaining agent for all bargaining unit employees at the Daishowa Mill (James River II) in Port Angeles, Washington. In that regard, our concerns dealt with the potential loss of jobs, but also indicated our thoughts dealing with environmental and fish loss issues.

In his letter acknowledging our status, former FERC Secretary Kenneth P. Plumb stated in part, "Participation of the intervenor shall be limited to matters set forth in its motion to intervene." Since being accepted, we have limited our participation in the dispute, even though there have been many occasions when, after receiving other intervenors' submissions, the thought of submitting rebuttal ran very high.

We now write pursuant to your notice of April 30, 1991 regarding an extension until June 28, 1991 to comment on the environmental impact statement related to the subject matter. We again address our concerns consistent with our status as an intervenor.

WPP-1: Basis for concern is noted.

DRAFT
STAFF REPORT

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission

June 4, 1991
Page Two

Job Loss

The Clallam County Economic Development Council prepared an excellent reflection of the potential loss of jobs if the Daishowa Mill were to shut down because of the loss of power to operate. This submission was written to the Washington State Department of Ecology on December 31, 1989. We've taken the liberty to include that correspondence with this presentation, and in that regard we submit that even though we recognize the fish and environmental issues, we remind FERC that without jobs there will be no people, and with no population Port Angeles will cease to exist.

WPP-2 Further to this point, Daishowa is planning to expand its operations at Port Angeles. Construction is starting on a de-inking process that will allow for the recycling of newspapers to provide raw material supply. This too is consistent with Federal policy. However, this project will require power to operate. A similar process at another northwest newsprint mill encompasses five acres alone in its storage area, not to mention the space for the processing equipment.

Daishowa has also stated it may expand its total product output in the future by installing another paper machine. If so, this will require additional power usage. To deny the licenses to operate the existing dams will further prohibit the potential of expansion that would add additional employment possibilities.

WPP-3 One other factor should also be considered in this scenario. More recently the spotted owl issue has surfaced as a further deterrent to not only the potential of expansion, but the real possibility of maintaining the status quo. In order to make paper there must be raw material, i.e., pulp. Pulp is made from wood chips, and if cutting rights are severely curtailed or stopped all together, no wood chips mean no pulp, and subsequently no paper. Daishowa is taking steps to offset this problem to some degree with the addition of its recycling operation. However, that in itself will probably not supply the total fiber supply that is required. The point of this is that companies and the workers they employ, including those at Daishowa, Port Angeles, who belong to the AWPPW, must be able to have the necessary required raw materials, including an adequate supply of electrical power, in order to stay in business.

These remarks are consistent with 3.9.3.2 and 4.2.8.2 of the Impact Statement.

Fish Runs

WPP-4 In our original statement of position, we also alluded to the fish run issue. Daishowa/James River II has announced its intentions to work to restore all appropriate fish runs in the Elwha River, consistent with retention of the two dams.

WPP-2: EIS Section 2.7.3 includes discussion of the paper recycling project. Sensitivity analysis addressing increased mill energy demand is included in Appendix E.

WPP-3: Position noted.

WPP-4: Although some stocks have been reduced in the Port Angeles area, there are substantial runs in other Olympic peninsula streams that are maintaining and in some cases increasing in size (e.g., Hoh River fall chinook). Some of the demise of the stocks in the Port Angeles area have been caused by many factors, including habitat alterations. The habitat in most of the Elwha is in excellent condition because it is in the Olympic National Park and should not have the problems that some other streams in the region have had. The staff agrees that substantial agreement among many management groups are needed to restore runs, but there are mechanisms in place for these to operate.

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission

June 4, 1991
Page Three

We note that on Friday, May 31, 1991, four environmental groups filed an appeal in federal court that is intended to force the removal of the two dams and restore salmon runs.

We can't help but ask, "What fish run?" We understand this has been a strong argument throughout this continuing debate. However, with the demise of the fish runs on other major rivers in the Port Angeles area, are we so naive to think the Elwha River alone can return a run of fish when, owing to other factors, our existing fish returns are being destroyed by other means? Perhaps then we should also remove WPP-4 cont'd every dam on the mighty Columbia River so as to return the fish runs to the multitude of that river's tributaries.

The Northwest Power Planning Council is continually groping with this dilemma and has not found a solution as yet. The truth is that unless something is done to halt the taking of these migrating species in outside waters, there will be little if any fish runs left in any of our rivers, dams or no dams. We submit the fish run issue is nothing more than subterfuge, similar to the spotted owl issue in the ongoing timber supply debate. We further submit that as brutal as it may sound, these environmental groups should curb their tie-up of our judicial process, along with the associated costs, and direct their energies toward resolving differences in a prudent manner.

Power Supply

Where is the power to come from if these dams are removed? Here we suggest a reading of Marple's Business Newsletter dated January 9, 1991. If one can believe this report, and we have no reason to doubt it, WPP-5 there is no surplus power available, and if that is true it is totally contrary to those who advocate that the Daishowa Paper Mill in Port Angeles can meet its current and future power requirements by purchasing power from B.P.A.

For the reasons stated, we strongly recommend that the requests for licensing be granted.

Sincerely,

James A. Thompson
General Vice President

JAT:jmh

WPP-5: Potential sources of replacement power are addressed in EIS Section 2.7.

CLALLAM COUNTY
ECONOMIC DEVELOPMENT COUNCIL

102 E FRONT • PO BOX 1085 • PORT ANGELES, WA. 98362 • (206) 457-7793

December 21, 1989

Tom Elwell
Environmental Review
Washington Department of Ecology
Mail Stop PV-11
Olympia, WA 98504-8711

RE: Draft Environmental Impact Statement: Expansion of Daishowa America Paper Mill, Port Angeles, Washington

Dear Mr. Elwell:

The Clallam County Economic Development Council has supported Daishowa's proposal to expand its paper mill in Port Angeles. As the second largest private employer in Clallam County, the present mill is one of our economic cornerstones, and the average wage is more than double the average wage in the county as a whole. With wages that can support families, the jobs there are extremely important to our community's social and economic health. The University of Washington Input/Output Model for the state of Washington calculates that each job in a paper mill creates 4.03 additional jobs. That means that Daishowa's employment of 320 is responsible for 1290 additional jobs. The combined total of 1610 is approximately 10% of our county employment. For that reason, we have welcomed Daishowa's plans to make a major capital investment in the facility, thereby extending its life expectancy.

Clallam County's manufacturing employment has shrunk from about 4,000 ten years ago to about 3,000 today. Our employment base has been increasing during the latter half of the decade, but most of the new jobs are in trade or services, sectors where the average wage is less than one-third that paid in our pulp and paper mills. The proposed expansion presents an opportunity to recapture some of that manufacturing job base.

We have also appreciated the Daishowa's decision to include interested agencies and members of the public from the very early stages of planning for this expansion. Through an Ad Hoc Committee, the company desired that concerns regarding all aspects of their plans would be aired and

Tom Elwell
Daishowa EIS
Page 2

addressed as early as possible. Innumerable changes from the original design have been made in attempts to make the new mill as environmentally sound and as responsive to community concerns as current technology and cost effectiveness will allow. The decision not to fill the log pond is the most noticeable change.

There is risk involved in this strategy of early public involvement. A change to mitigate one concern often makes change necessary in many other areas. As the project description continuously evolves, the project proponent is vulnerable to charges of indecisiveness. Daishowa was willing to take the risk of an open process, and we appreciate the opportunity to be heard from the beginning.

We understand that decision makers and regulators will need to balance many complex factors as they consider the permits for Daishowa's expansion. We ask that the importance to this county of maintaining a strong manufacturing base be part of that equation.

Thank you for your consideration. We will submit a more detailed response in writing by January 5.

Sincerely,

Judith St. Claire

Judith St. Claire
Executive Director

Washington Wilderness Coalition

Statement to FERC, April 4, 1991

The Washington Wilderness Coalition is pleased to have this opportunity to add its voice and the voices of its citizen membership to the public call for the removal of the Elwha River dams.

The Washington Wilderness Coalition is a statewide, citizen action and education based, grass roots organization with over 1200 individual members and approximately 30,000 affiliated members through its 41 associated member groups. The coalition (WWC) has a strong interest in Wilderness, public lands management, rivers, recreation, the N.W. Marine Sanctuary, Forest Watch activities, the Gray Wolf, the Grizzly, the Lynx, other endangered or threatened wildlife and energy policy & use as it impacts the wild places & wild animals which share the state with humans.

WWC joined the call for removal of both Elwha dams two years ago. Our members have traditionally used and enjoyed the Elwha for its fishing and for the recreational opportunities - including rafting- that it has offered. Removal of the dams would certainly enhance all of those activities and lead to a a healthier ecosystem for the river.

The Elwha was once one of the great fish habitats and recreational rivers in the world. WWC is calling for the removal of both dams and the restoration of the Elwha's legendary status. Our membership would like to see that restoration fully implemented as soon as is feasible.

The NW Salmon is threatened and endangered across this region. If these species of anadromous fish were people, a tribe or a race, we, the non Native American human inhabitants of the region would be very close to committing genocide. As things stand we must partially make our argument for dam removal by assigning an economic value to the fish the river has been home to for centuries beyond counting. After decades of brutality we have the opportunity to redress a wrong. In redressing this excessive man made condition there seem to be no losers and an abundance of reasons to remove the dams.

Removing the dams will increase the value of the fish runs associated with the Elwha. That increased value will come to outstrip the value of the electricity the dams now provide. That increased value will outlast the dams and the pulp mill. In addition the recreational opportunities will surely become tremendously enhanced and enlarged. WWC believes

that these values aside, the health of the river ecosystem will also benefit. When the river ecosystem is returned to its natural state the exposure to any conceivable flood problems will be minimized in a manner unrelated to reliance on old, deteriorating dam structures and human altered riverbed and riverbank conditions.

WWC believes that conservation by Dalshowa America and the substitution of other highly available sources of energy should replace the power generated by the dams.

WWC believes that FERC and the citizens of this region have a ground breaking opportunity in this instance to remedy an ecological tragedy. This opportunity for restoration should not be missed.

This issue before you should not be whether or not to remove the dams, but how soon can you get started. The issue should not be how much will it cost, but how much will it add to the whole region. WWC would like to see planning - with continuing public input- for removal of both dams begin soon.

WWC recommends that the removal take place in such a manner as to consider all the ecological and environmental factors. We further urge that the entire removal process and timetable be subject to public scrutiny and ongoing public monitoring over the course of the removal and restoration.

WWC would like to insure that any package of incentives offered Daishowa America to gain their acceptance of a consensus for dam removal contains stringent energy conservation and environmental (non) pollution standards.

WWC-1 With reference to the DEIS: Specifically with reference to the preliminary conclusions contained in section 5; The public does overwhelmingly support removal of both dams and restoration of the fish habitat. Additionally, WWC believes the period of (de) construction may take more than 4-5 years in order to manage the silt buildup now stored.

If the question here were between delivering power to Daishowa America and restoring the habitat there might be a need for prolonged discussion and public debate. That is not the choice. Daishowa America can be easily supplied through other means. The question is how do we best remove both dams and restore the Elwha.

###

Mark Glazer, Conservation Director, WWC
P.O. Box 45187, Seattle WA 98145, tel: 206-633-1992

WWC-1: Comments noted.

COMMENTS OF INDIVIDUALS

Lois Cashell
Secretary,
FERC
825 North Capitol Street NE
Washington DC 20426

Dear Secretary Cashell, Mr. McKitrick and other esteemed officials at FERC, please consider the following comments on FERC/EIS-0059D:

Having read the DEIS thoroughly and critically, participated in the workshops and public hearings, studied most if not all of the considerable public record of the building, rebuilding and maintaining of the dams, the history of FERC's and FERC's predecessors involvement with the licensing and relicensing of the Elwah dams, the GAO analysis of FERC's licensing authority, the position statements of NPS, NMFS, USF&W and other agencies concerned with restoration of Salmonids, and conducted countless hours of interviews with FERC, EBASCO, NPS, Congressional staff, officials of the Tribes, and concerned experts inside and outside the agencies, I offer the following observations because I am somewhat dissatisfied with the DEIS FERC/EIS-0059D. I elected not to comment publicly at the Seattle hearing because, as I stated at the time, "it was time for everybody to go home." Because, as I point out below, so much of the required material is missing from the DEIS, the following comments are of a generally philosophical nature.

Although your DEIS is a relatively superior document, compared to other NEPA documents I have dissected recently, it fails to address several of its fundamental responsibilities, taking on, in their stead, extraneous matters irrelevant to its primary responsibility, which is to provide the draft, or basis, of a document which sets forth the essential issues, concerns and opportunities present in the situation, so that a preferred alternative course of action may be eventually determined, using the FEIS as the basis for decision.

OBSERVATION OF DEIS's PRIMARY FLAWS

I-1 FERC appears to have mistaken its basic responsibility in the consideration of licensing the Elwha Dam and relicensing the Glines Dam. According to NEPA, the purpose of the DEIS is to consider the Applicant's legal responsibility to mitigate the damages that will result from these dams and to consider the adequacy of the mitigation the Applicant has proposed, pursuant to the Applicant's legal responsibilities. The FERC DEIS generally fails to present the Applicant's responsibility under the law and substantially fails to provide this analysis.

I-2 The second fundamental flaw in the FERC DEIS for the Elwha hydroelectric projects is the fact that the option of full mitigation *without* dam removal is not considered. In the course of exhaustive research, I have found little credible evidence that the mitigation proposed by the Applicant for the upper dam satisfies the Applicant's legal requirements or is even necessarily worthwhile, let alone "self-sustaining." The problems of mitigation are diverse and complex, while the Applicant's proposals, even as modified by FERC's suggestions, are reductionist and fail to consider the variety of needs of the various anadromous fish stocks endangered by these projects. A further Alternative is required.

I-3 Thirdly, I am not at all comfortable with FERC's tacit acceptance of the inescapable consideration of the first dam's (Aldwell) prior blocking of all anadromous fish, to allow the second dam (Glines) to be built without consideration of anadromous fish. This matter is not adequately discussed in the DEIS. Given the necessity of discussing the existence of the Aldwell Dam in the course of licensing the Glines dam without fish passages, the failure to consider the matter of licensing the Aldwell Dam at that time appears to be evidence of deliberate malfeasance or at the least unwarranted non-feasance. The historical relationship between the admitted illegality of the first dam and the use of this illegal dam to excuse the second dam from compliance seems to run counter to the intent of the Federal Water Power Act, and of the Agency's implicit responsibilities as administrator of the public trust.

FERC'S ECONOMIC "SIDE-BOARDS" ARE ALSO SERIOUSLY FLAWED:

1

RESPONSES TO INDIVIDUALS

I-1: The staff disagrees. The purpose of the EIS is to disclose the environmental effects that can be anticipated with the applicant's proposal for the new licensing term, as well those effects that would be associated with reasonable alternatives.

I-2: The applicant's legal requirement with regard to these projects is to comply with the terms and conditions of any new license granted. Comments on the deficiencies in the applicant's proposal are noted.

I-3: Viewpoint is noted.

STAFF REPORT

COMMENTS OF INDIVIDUALS

I-4 During the workshops preceding the public hearings in Port Angeles and Seattle, I learned that considerably more rigorous mitigation strategies were developed by EBASCO's engineers, including a fish-ladder for the Glines Dam, yet that these admittedly more effective, but higher-cost mitigation strategies were excluded from consideration by strict economic "sideboards" established within FERC and imposed on EBASCO.

I-5 I question FERC's procedural authority under NEPA to establish as de facto pre-conditions that the probable cost of mitigation must not exceed the projected value of the power generated. Mitigation, in this case the restoration of self-sustaining fish runs, appears to be a legal requirement of operating these dams. If the cost of mitigation appears to exceed the value of the power produced, this might indicate to the Applicant and to FERC that the project may well fail the test of the marketplace. I am emphatic in my contention that it is not FERC's business to shield the Applicant from this test, and I do not expect that I will be alone in raising this point.

I-6 NEPA, supported by recent case law, makes it clear that the purpose of the EIS is to allow a test of whether or not the Applicant's proposed mitigation provides the environmental protection required by law. Where an agency is faced with incomplete or unavailable information about an action,s environmental effects, it must disclose the absence of that information, and in addition must prepare a worst case analysis. The DEIS contains no such analysis. In the event the Applicant's proposed mitigation were to fail, what would we have, and what would be our recourse? On this line of reasoning, it seems more appropriate for FERC to perform "risk-benefit" analysis than "cost-benefit analysis of the proposed mitigation. It should be clear that FERC is not authorized by NEPA to perform these tests in advance, outside the scrutiny of the public or the agencies with whom it is required to co-operate, according to rigid set of implicit economic pre-conditions provided by the Applicant, and then limit the discussion to these pre-drawn conclusions.

RELIEF REQUESTED:

I-7 Given the Applicant's explicit public statements of dissatisfaction with the economic analysis used in the DEIS, particularly with the projected cost of replacement electrical power, presented by representatives of James River at both public hearings, it seems inevitable that FERC will be called upon by the Applicant to substantially revise its projections concerning the cost of replacement power.

I would applaud a more realistic financial analysis, in fact I consider it essential. In the event that FERC agrees to consider the economics over a longer period, perhaps the full 50 year license period, and thus assign a substantially higher average cost to replacement power (thereby assigning a significantly higher future value to the electricity generated by these dams) then FERC is also freed from the crippling economic limitations it elected to impose on the DEIS. This would free FERC, the Applicant and the JFWA to consider the question of whether substantially more costly and more thorough methods of mitigation, or even mitigation measures of unlimited expense might provide passage sufficient to allow fish restoration. Once adequate mitigation, satisfactory to all concerned parties, can be assured, the matter of its "cost-benefit ratio" is clearly the purview of the Applicant.

APPLICANT's ECONOMIC RESPONSIBILITY

I-8 The matter of considering the value of replacement power as a cost of dam removal, on the other hand, is based on a complete misunderstanding of the Applicant's responsibility in this matter. If the public is to be liable for the Applicant's loss of unlimited, uncompensated access to a public resource, then surely the Applicant is responsible to compensate the public for the loss of 80 years of fish and the vast amounts expended by State, Tribal and Federal Agencies to date in their efforts to maintain and rebuild the stocks and fisheries damaged by these dams, and the amount spent by the Army Corps of Engineers and other agencies in the armoring and nourishment of Ediz Hook.

(The bulk of the preceding discussion is based on the assumption that there remains a possibility that the dams are "socially useful" and therefore might be worth saving. This is a difficult question, not adequately addressed in the brief history of the projects presented in the DEIS.)

I-9 I do not believe that the past history of these dams has been particularly exemplary in this regard. To date,

RESPONSES TO INDIVIDUALS

I-4: The information is incorrect. The rationale for not recommending a Glines Canyon fish ladder is discussed in Section 4.1.3.3.

I-5: The Commission does not establish the referenced pre-condition. Instead, the Commission addresses resource tradeoffs within the context of equal consideration of developmental and nondevelopmental values.

I-6: The uncertainty surrounding fish restoration predictions is described in Section 5.6.1. Under the terms of a new license, the Commission can require additional measures when monitoring shows mitigation efforts are unsuccessful.

I-7: Comment noted.

I-8: Applicant compensation for past damage is not a licensing consideration.

I-9: Comment noted.

I-9 cont'd they have done very little of lasting benefit for society at large, serving to enrich a very small number of individuals at enormous expense to the public and to the environment. These dams are monuments to a bygone era, a time of banditry, of privilege without the tempering hand of responsibility. The Applicant's proposed mitigation is simply another round of the same sort of banditry. For the price of a couple of dams, Crown Zellerbach appropriated the generative power of the river and used the greatest part of that power to turn almost all of the enormous potential wealth of a vast public forest, tens of thousands of acres of Hemlock trees, into an endless stream of waste and poisonous pollution, fouling the air and poisoning the waters of the Strait. The newsprint they produced, over 1000 miles of it per day, has been clogging landfills throughout the Western United States for the past 50 years. Daishowa continued this appalling record of environmental insensitivity, with "dry sundays" during low-flow seasons, days when the flow of the lower reach of the river was virtually eliminated to conserve water behind the dam for the next weeks electricity. In the face of public scrutiny, this kind of abuse has apparently begun to slow, but it is a leaky old mill, and Daishowa has a long way to go before they can claim to have truly turned this operation around.

So, that is what society has gotten from these dams. It is shabby compensation to have received in return for the mis-appropriation of the river by a man, Tom Aldwell, well-known to have been a grafter and a bandit, a man who "tore out history, to plant dreams", whose dream turned to rubble before his eyes when the first dam gave way, so he pulled a fast one on the City Council so he could sell his dam, and the City's property on the spit to the Zellerbach's when things got rough. There is so much shabbiness in this story it is hard not to tell it all. Consider the City of Port Angeles' much-worried-about Ranney-well water system. This system was built using Federal Drought Relief money, at a time when people in P.A. were still watering their lawns in utter ignorance of the "drought" affecting their community; a time when the City's "Industrial Diversion", the pipeline to the mills, was leaking nearly as much water as their new Ranney Municipal supply now provides.

CONCLUSION:

I-10 It is entirely unacceptable to consider this shabbiness as fair compensation for the consignment to the scrap-heap of the past, for all eternity, of at least 10,000 years of evolution in the Elwha's Salmon stocks. These mis-deeds should neither be ignored nor forgotten in the course of considering the merits of the Applicant's proposals. FERC is obligated to maintain a more objective neutrality in its consideration of the options in this relicensing proceeding.

Thank you for your consideration,

Joe Breskin
35 Cape George Wye
Port Townsend, WA 98368
(206)385-3771

I-10: Comment noted.

COMMENTS OF INDIVIDUALS

3057 NW 62nd Street
Seattle, WA 98107
April 7, 1991

Ms. Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capital Street NE
Washington, DC 20426

RE: Elwha River Dams

Dear Ms. Cashell:

I-11 I am writing this letter to express my strong support for removing both dams on the Elwha river.

I base my opinions on written accounts of the resources once supported by this river as well as personal experiences in hiking almost the full length of the river through the Olympic National Park. In my profession of water resource management, rarely have I seen such a clear case of the need to and opportunity for taking action to restore and protect a beneficial use where the costs to society and individuals (corporations) is so low.

I-12 The salmonid resource potential from the Elwha River is legendary. Unlike most other cases where the old stories are almost incredible, people are still alive today who can verify the unique resource that once existed. More importantly, because the bulk of the watershed is under National Park and wilderness protection, all the basic elements necessary for regaining those resources still exist. Only the obstructions in the river must be removed.

I-13 Sufficient analysis has been done to demonstrate that energy sources are available to Daishowa through replacement of antiquated, electrically wasteful equipment. The money Daishowa is offering to spend on unproven and likely unsuccessful salmon transport schemes, augmented with BPA retrofit funding will secure the jobs and income so important to Port Angeles. This is a rare case where the resources can be preserved without causing human economic dislocations. The opportunity should not lost.

Thank you for considering these thoughts. I hope you will agree with me that these illegal dams should be removed as soon as possible.

Sincerely,

William J. Eckel

William J. Eckel

cc: Governor Booth Gardner
Senator Brock Adams
Senator Slade Gorton
Representative John Miller

RESPONSES TO INDIVIDUALS

I-11: Your position favoring dam removal is noted.

I-12: Comment noted.

I-13: Comment noted.

COMMENTS OF INDIVIDUALS

Ms. Lois D. Cashell
Secretary FERC
825 North Capitol St. NE
Washington, D.C. 20426

April 3, 1991

Dear Ms. Cashell:

I-14 I am writing this letter in support of removing the Elwha Dam and the Glines Canyon Dam from the Elwha River in Washington State.

I-15 The Elwha Dam was constructed in violation of Washington State law which required fish passage facilities at every dam blocking salmon migration. After construction was complete the law was changed so that hatcheries could be built in lieu of fish passage facilities... and its been downhill since then. The Elwha once boasted legendary runs of 100 pound Chinook, along with every species of Pacific salmon including the Pink salmon which was estimated to have runs of 275,000 strong. Today this run of Pinks is near extinction.

I-16 With the problems we are facing with the Spotted Owl and Columbia River salmon, which will take years to sort out, the problems of the Elwha can be sorted out now. Energy efficiency measures have been identified at the Daishowa mill (which uses 100% of the power generated by these dams) which are equal to the power generated by the dams. With these energy efficiencies completed there would be no justification to keep the dams, and many justifications for removing them.

These dams have devastated the Elwha and the salmon runs which made it famous. No private company should have the right to destroy a resource owned by all.

I strongly support the removal of these two dams. Thank you.

Sincerely
Kevin O'Hara

Kevin O'Hara
107 Lone Yew Rd
Toledo, WA 98591

RESPONSES TO INDIVIDUALS

I-14: Your position favoring dam removal is noted.

I-15: Comment noted.

I-16: Comment noted. Staff wishes to point out that conservation opportunities at the mill will be available for implementation regardless of whether the dams are removed. Cost-effective conservation measures would be most beneficial to the mill if they were used to displace higher cost purchased power rather than the lower cost power produced by the Elwha and Glines Canyon projects.

STAFF REPORT

COMMENTS OF INDIVIDUALS

3033 Fauntleroy Avenue S.W.
Seattle, WA 98126-2318
April 7, 1991

Lois D. Cashell
Secretary
Federal Energy Regulatory Commission
825 North Capital St. N.E.
Washington, D.C. 20426

RE: Elwha River Dams Licensing

Dear Ms. Cashell:

I-17

Unfortunately I was unable to attend the recent public meetings in Port Angeles and Seattle, Washington, and to testify on the DEIS issued by your agency in the matter of the Elwha River Dams relicensing. I am writing to express my fervent desire that the Commission deny new licenses for the Elwha and Glines Canyon dams, and that these dams may be removed.

The reasons for seeking the dams' removal have been eloquently and forcefully stated by others, including the Commission in the DEIS. Both of these dams block passage of anadromous fish species, including salmon and trout. The dams are inefficient as power-producers. They should come down.

I urge the Commission to act expeditiously in issuing the Final EIS, and then denying the licenses. Please do not delay this vital action.

Yours truly,

Michael P. Nagan

cc: Senator Brock Adams
Senator Slade Gorton
Representative James McDermott
Governor Booth Gardner

RESPONSES TO INDIVIDUALS

I-17: Your position favoring license denial and dam removal is noted.

To Lois D. Cashell

I-18 I am writing you to show my support for removing the dams on the Elwha River. It is obvious that they are not required and they have caused a almost total destruction of the Elwha River fishery. lets do something right for once and take them out.

Sincerely yours
Douglas Townsend
9229 Gublin Lane
Everett, wa. 98203
206-337-1709

I-18: Your position favoring dam removal is noted.

DEAR FERC,

I-19

I DON'T USUALLY GET INVOLVED AND USUALLY DON'T LIKE WRITING LETTERS, BUT I FEEL THAT I OWE MY KIDS AND FUTURE GENERATIONS THE CHANCE TO ENJOY SOMETHING THAT IS ONLY A SHADOW IN OTHER RIVER SYSTEMS BECAUSE OF GROWTH, INDUSTRIALIZATION, AND DISAPPEARING HABITAT. WE HAVE A CHANCE TO RIGHT SOMETHING THAT WILL IMPACT THE FUTURE LIKE NOTHING ELSE WILL. THE REMOVAL OF THE ELWHA RIVER DAMS WOULD BRING BACK FISH RUNS THAT WOULD ECONOMICALLY BENEFIT THIS STATE FAR MORE THAN THE LITTLE BIT OF POWER THAT IS PROVIDED TO DAISHOWA'S MILL. PLEASE DO IT! REMOVE THE ELWHA DAMS!!! WE OWE IT TO OUR KIDS AND THEIR KIDS.

THANK YOU,

Bruce L. Anderson
19205 77th E.
BONNEY LAKE, WA.
98390

I-19: Your position favoring dam removal is noted.

?910 NE 51st
Seattle. WA 98105
April 4, 1991

Dear Lois D. Cashell,

I-20 I am writing about the Glines and Elwha dams on the Elwha River in the Olympic Peninsula. It is time to remove those dams. The salmon fisheries, when restored to the Elwha, would have much greater value than that of the dams. In any case, the Glines dam is illegal since it is located inside Olympic National Park. The removal of the dams and the restoration of the fisheries would restore the integrity of Olympic National Park. The electricity supplied by the dams can be replaced by energy conservation and the regional Bonneville Power Administration. Therefore I urge you to please support the removal of the dams on the Elwha River. Thank you.

Sincerely,

Jon Titus

I-20: Your position favoring dam removal is noted. The Glines Canyon dam was built prior to designation of the Olympic National Park (Section 1.2.1.1), and staff is not aware of any evidence suggesting that the dam's presence in the park is, <u>per se</u>, illegal.

STAFF REPORT

3-28-91

Dear Ms. Cashell,

I am writing to inform you of my feelings concerning the relicensing of the dams on the Elwha river here in Washington state.

I-21 These dams have, for 80 years, effectively ruined the Elwha ecosystem. They were built without fish ladders in violation of state law, and disrupt the balance which should be present in the Olympic National Park, which has been recognized as a World Biosphere Reserve. Surely such a treasure deserves better treatment than what is currently in place.

The park, the fish runs, & the water in the Elwha belong to you and I, and all the American people, not specifically to James River Corp. or Daishowa America to use and abuse as they see fit. Restore the once mighty fish runs and allow the river to run free & wild again. Thank you for your consideration pertaining to this matter. Sincerely,

Gregory Rupert
10006 182nd Av. S
Issaquah, WA
98027

I-22 I concur with Mr. Ruperts position and would also appreciate your consideration. Doug Beck
10044 2nd Ave SW.
Seattle, WA - 98146

I-21: Your position favoring dam removal is noted.

I-22: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

Lois D. Cashell
Secretary
Federal Energy Regulatory Commission
825 North Capitol St NE
Washington, D.C. 20426

Dear Ms. Cashell,

I-23 I support removal of the dams on the Elwha River in Washington State. Retaining the dams makes no business sense, and removing them allows restoration of one of the great rivers in our state.

In the summer of 1988, my wife and hiked across the Olympics, from SW to NE. Four of the seven days on this trip were spent along the Elwha. Some of the first overnight hikes I ever made were with friends that I still hike with, twenty years later, and were hikes along the Elwha. The Elwha has been an important part of my life. I anticipate it will play a part in the life of my 2 year old son, too.

Free the Elwha!

Yours truly,

John Clarkson

copies to:

Gov. Gardner
Sen. Adams
Sen. Gorton
Rep. McDermott

RESPONSES TO INDIVIDUALS

I-23: Your position favoring dam removal is noted.

STAFF REPORT

Russ Ladley
27716 21ST PL S.
Federal Way, WA 98003
April 5, 1991

Lois D. Cashell, Secretary
FERC
825 North Capitol St. N.E.
Washington, D.C. 20426

Dear Ms. Cashell:

I-24 I am writing to ask your support for the removal of the Elwha River Dams. I am a fisheries biologist and quite familiar with the situation on the Elwha. The Elwha River was one of the greatest rivers in the Northwest and capable of producing the largest runs of salmon and steelhead in western Washington. What has happened there is beyond reprehensible. The dams must be removed. The time is now to develop plans for dismantling these structures.

I am presently dealing with a FERC licensing issue on a river within my jurisdiction. Through my dealings first hand and based on the experiences of my colleagues, it has become painfully obvious that waiting for FERC to make a decision is an extremely tiresome. I am not content to see this issue left on the back burner any longer. We need action now! Neither dam should ever have been built. The fact that they still exist is testimony to the complete disregard to environmental issues with which our state government operates.

The value of the fish and wildlife resources impacted by the dams, far outweighs the benefits derived from power generation. The scenic beauty of the Olympic National Park is enjoyed by thousands of visitors each year. The dams serve only to lessen the utility bill for the Daishowa America Mill.

Removal of the dams would go a long way toward realizing Governor Booth Gardner's goal to revitalize and strengthen the fishing industry within our state.

Lets work to restore the Elwha River.

Sincerely,

Russ Ladley

I-24: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

April 5, 1993

Dear Lois D. Cashell;

I-25

I am writting to urge you to support removal of the two dams on the Elwah River: the Elwah and Glines Canyon dams.

As an outdoorsperson, I have driven, hiked and fished this wonderful Olympic peninsula river and have dreamed of the wild fish that once inhabited its upper reaches. Sadly, poor planning and lack of knowledge eliminated several strains of anadromous fish - including the largest sized chinook salmon in the lower 48 states.

But you, as an elected offical, have an opportunity to turn the environmental corner and maybe help my dream become a reality. Make yourself a winner along with the Federal government, the State of Washington, the Elwah nation, James River Inc., Daishowa America and certainly the salmon and steelhead in the Elwah River.

I believe we can have a "win - win" scenario if you will join me in supporting dam removal on the Elwah River.

Thank you,

David A. Little

David A. Little
6918 192 SW
Lynnwood WA. 98036

RESPONSES TO INDIVIDUALS

I-25: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

April 5, [illegible]

Lois D. Cashell
Federal Energy Regulatory Commission
825 North Capitol St. N.E.
Washington, D.C. 20426

Re: Glines Canyon and Elwha Projects

Dear Ms. Cashell,

My name is Mike Stimac and I was in attendance at the meeting at the High School in Port Angeles, Washington, on April 3rd. I could not stay for the full length of the meeting and so was unable to express my concerns.

I-26 I have been a resident of Mason and Kitsap County of Washington State all my life. I have hiked and fished all the major river valleys on the Olympic Peninsula. I was very excited years ago when I first heard of the possibility of removing the dams on the Elwha River. I would love to see the wild steelhead and huge Chinook spawning again in the upper reaches of the Elwha. There is no other river in our state that offers this ideal habitat for these rare and beautiful fish. We have the opportunity before us to restore a salmon run that has been dead for almost 100 years. I would like my children and theirs to see the fruition of our labors. Whatever the cost is, I feel it would be well worth it for the sake of future generations.

Sincerely,

Mike Stimac
P.O. Box [illegible]
Poulsbo, WA [illegible]

RESPONSES TO INDIVIDUALS

I-26: Your position favoring dam removal is noted.

Kate Whitlock
2007 26th Avenue E.
Seattle, WA 98112

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol St. N.E.
Washington, DC 20426

Dear Lois Cashell,

I-27 I am writing to you out of my deep concern for an issue presently being debated in the state of Washington. There are presently two hydroelectric dams on the Elwha River, the Elwha Dam and the Glines Canyon Dam, both of which block the passage of salmon to the upper reaches of the river. These dams were built in the early part of this century, well after Washington legislature had passed laws requiring fish passage devices on dams placed in the path of migrating salmon. The Glines Canyon Dam is not only lacking on fish passage devices but it is also built within the Olympic National Park, a public resource belonging to all citizens of the United States. Not only have these dams blocked passage to upper waters but they have also destroyed habitat suitable for spawning in the lower reaches of the Elwha River. Mitigation for this travesty through installation of fish hatcheries has proven unsuccessful. Therefore not only are these dams illegal, but they have also been instrumental in destroying the unique and spectacularly beautiful runs of wild sockeye, coho, pink, chinook and chum salmon on the Olympic Peninsula.

I am writing to support the immediate removal of both the Elwha Dam and the Glines Canyon Dam from the Elwha River. Economic studies show that dam removal would not threaten job security at the mill drawing electricity from these dams. The loss would be made up by the regional Bonneville Power Administration. Salmon are not only a valuable natural resource but they are also an indicator group of the overall health of our beautiful National Parks and Forests which feed the rivers which in turn feed the fish. In this day and age we too often driven by the dollar profit or perceived profit to be obtained from our natural resources. We must start preserving our natural resources out of admiration not only of their beauty but for the perfectly balanced interactions that drive these natural systems (that is until mankind interferes). I am enclosing a photograph from a river in British Columbia whose name does not matter. These are adult sockeye salmon returning to spawn. I hope someday to see an equally spectacular site on the tributaries of the Elwha River. Please help make this possible by demanding the removal of both the Elwha and Glines Canyon Dams on the Elwha River. Thank You for your help on this important issue.

Sincerely,

I-27: Your position favoring dam removal is noted.

DRAFT STAFF REPORT

COMMENTS OF INDIVIDUALS

I-28

23 wajwagtus

In an age of fish farmed salm
the removal of the Elwha da
represents one of the hopes for
strengthening the wild races
the species. Restore the King
King salmon to its lofty s
grounds in the Olympic Peninsula
generations will thank you. Robert

RESPONSES TO INDIVIDUALS

I-28: Your position favoring dam removal is noted.

March 29, 1991

Paul E. Brain
11132 S.E. 29th Place
Bellevue, WA 98004

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 N. Capitol St. NE
Washington, DC 20246

Governor Booth Gardner
Olympia, WA 98504

Senator Brock Adams
U.S. Senate
Washington, DC 20510

Senator Slade Gorton
U.S. Senate
Washington, DC 20510

Re: Removal of the Dams on the Elwha River, Washington

I-29 We are writing to express the opinion that the dams on the Elwha should not be relicensed and to express support for removal of those dams. Our reasons are as follows.

I-30 Initially, these dams have severely impacted, and may ultimately destroy, a unique and valuable public resource for what is primarily a private benefit to the operators of the Port Angeles mill. These dams do not serve the public directly. Moreover, the available evidence indicates that a decision not to relicense these dams would have little or no impact on the cost of operations of the mill. Thus, a decision not to relicense is unlikely to indirectly impact the public interest by affecting either levels of employment or tax revenues generated by the mill. Any analysis of the impact to the public of the licensing decision has to lead to the conclusion that the public interest would best be served by not relicensing.

I-31 Second, the dams were constructed in violation of both state and federal statutes. Particularly in light of the contents of the draft environmental impact statement, we cannot imagine that a decision to issue new licenses for these

I-29: Your position favoring license denial and dam removal is noted.

I-30: Comment noted. The revised cost analysis provided in the FEIS (Section 2.7.3, Table 2-20) indicates that the cost of power to the mill would be about 13 percent higher under the dam removal alternative than under the applicant's proposal.

I-31: Comment noted.

March 29, 1991
Page 2

I-31 cont'd

dams would do anything other than spawn litigation. Frankly, as attorneys with more than passing familiarity with the legal issues involved, we personally would not care to be responsible for arguing that a decision to issue new licenses was justifiable under the facts here and the applicable standards of review.

I-32

Finally, the entire history of federal involvement in the development of hydroelectric power in the Pacific Northwest has been a history of the destruction of the native anadromous fish runs. The Columbia system runs used to be measured in the tens of millions. Now, ten thousand Spring Chinook is a large number. This is not to say that the development of the public power system we all enjoy here was not both vital and necessary.

Nevertheless, the federal government, including the FERC, has a responsibility to protect and enhance anadromous fish runs; morally, pursuant to various treaties, and as a matter of law. The Elwha, being virtually unique in this state in supporting native runs of all eight indigenous anadromous salmonids, is a particularly good candidate for fulfilling this responsibility. We would therefore urge that the FERC not relicense these dams and would also urge that the members of the Washington Congressional delegation to whom this letter is also addressed actively pursue this result. We hope that as a result, in the near future, fishermen's tales of the size and strength of Elwha springers will no longer be characterized as apocryphal.

Very truly yours,

Paul E. Grain

Paul E. Grain

Stephan O. Fjelstad

Deborah Knapp

Deborah A. Knapp

0078\001L006A.PEB

I-32: Comment noted.

2416 E. McGraw
Seattle WA 98112
5 Apr 91

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 N. Capitol St. N.E.
Washington, DC 20426

Dear Ms Cashell:

I-33 I am a long-time resident of Seattle who has experienced the marvelous beauty of the Olympic Peninsula and the national park there I want to express in the strongest possible terms the request that the two dams on the Elwha River--the Elwha and the Glines Canyon dams--be removed. I have seen these dams and they are a blight on the natural beauty of the area. But perhaps most importantly both, and illegally so, block passage of spawning salmon and trout. It was a real shame that these dams were built in the first place, but it seems to me that now is the time to save as much as we can.

Sincerely,
D Welti
D. W. Welti, M.D.

Copies to Governor Gardner, Senators Adams and Gorton, and Representative McDermott

I-33: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

April 8, 1991

From: Roy Niemi
1890 MATson Rd. PorTAngeles, WA. 98362

To: Federal Energy Regulatory Com. Office of Hydro Power Licensing ATT. Ronald McKitnick
825 N. capitol ST. N.E. Washington D.C. 20426

Subject: ELwha River Dams, Clallam county, Washington State.

I-34 1. The two Dams Lower ELwha and Glines canyon, Should be Removed

I-35 2. They have never been Legally accepted.

I-36 3. The Dams have destroyed one of The Best Salmon nurseries in The North West. U.S.

I-37 4 The power from The Dams is used by Japanese-owned Daishowa pulp Mill. for about 40%. of There electricity Needs. Profits go. To Japan

I-38 5. I am a native of Clallam County 68 years, I urge you people To Remove The Dams [illegible]

FILED
OFC OF THE SECRETARY
1991 APR 16 AM 11: 50
FEDERAL ENERGY
REGULATORY COMMISSION

RESPONSES TO INDIVIDUALS

I-34: Your position favoring dam removal is noted.

I-35: Comment noted.

I-36: Comment noted.

I-37: Comment noted.

I-38: Comment noted.

March-4-1991

THE TWO DAMS REMOVED/?

I-39

Damm how dumb can people be? Here they are going to rase our rates now and if they take the dams out they will go a lot higher, and just who in the hell is going to pay for the removeal of these dams? Gess who us the working man and the poor thats who.

Just what the hell is the matter with these people? Can,t they see beyond there nose we need these dams and more. They should be raised to make enough power to supply all of this county and a lot more that would be the most benefical to us all. Not jus a few environmentalmest who don,t give a damm for any but there pet beleafes they sure as hell don,t give a damm for people or if they starve or not. First they didn want the old groth trees cut(they wanted to set and look at them as they had nothing to do) so they made up the storie about the owl an I say made as there sure as hell is more owls than they can count.Then now they want to set on the bank and fish and watch the river flow by were the dam is at now.There can be a fish ladder put in for the fish to climb.And don,t say there can,t as there can be.And a hell of alot cheaper than what they say it will cost to take the dams out. And you can bet it will cost double what they say it will and you the people out there will pay for it in increased taxes.

And more thing,if they and the people out that want more fish; then why in hell aren,t they raseing cain about the real reason theres not fish in abundance here in all rivers and streams and in the strigh And thats all the countrys except the USA,are out there with there bic ships,steel nets catching ever thing they can get in there nets,and can them right on board.Why don,t they do some hell raseing about that That would help everyone and i gess they couldn,t stand that ,nor can it seems are politicians,They seem to be all for the environmentalest all they have to do is just say what they want and they all jump and even are judges seem to take their word as fact.They go oit do there own fact finding with there own people,Say what they want put down on paper what they want,what they beleave were it,s fact or not,just what they want,sign there name to it and that makes it a fact and it seem are elected officals go along with it,And yes it seem even are judges.I gess they have a lot of money and power and the can run or buy there way.Any way thats the way it seems and what i think.And i sure as hell don,t think much of an environmentalest any more not after what they have done to this west coast and the logging industire it shows how little they care about the people.An OWL or Fish,and they will rase all kinds of hell.Even a reward for a couple of dead owls. I don,t say they should have killed them,but i sure as hell don,t blar either i can understand their frustration. Why don,t they rase money to help the out of work logger,but there it is again the owl first.

BERT LAUDERBACK
4570 HWY 112 W
PORT ANGELES,WASH. 98362

PH.(206) 928-3353

I-39: Your position opposing dam removal is noted.

April 4, 1991

11808 S.E. 270th St.
Kent, WA 98031

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 N. Capital St. N.E.
Washingon, D.C. 20426

Re: Projects 588, 2683

Elwha River Dams

Dear Federal Energy regulatory Commission:

Please enter this letter in the written record for comment on the Draft Environmental Impact Statement pertaining to the licensing of the Glines Canyon and Elwha Dams on the Elwha River in Washington State.

I-40 As a concerned citizen and professional fisheries biologist, I have always been appalled at the incredible environmental and economic tragedy these dams constitute. The cheap hydropower which has benefited the local sawmill has come at the expense of the entire ecosystem above the dams. The cost in lost fish production alone must far exceed the savings in power costs to the mill.

I-40: Comment noted.

I-41 It simply is imperative that the removal of the Glines Canyon Dams be expedited to salvage the remnant genetic strains of the once mighty wild salmon runs of the Elwha River system. The dam retention alternatives cannot effectively restore the productivity of river.

I-42 The DEIS document has underestimated the mitigation costs of alternatives which leave either dam in place. Thus, accurate cost:benefit analysis favors the alternative of removing both dams. There should be no net loss of local jobs; I would expect a long term economic gain for the local economy due to enhanced revenues from commercial and recreational fishing and other tourism activities.

I-43 It will be a great moral victory for the people of this country when these dams, which are presently an affront to humanity, are removed. I trust FERC will do everything it can to speed up the process of dam removal. It is the obvious alternative to select.

Sincerely,

Lawrence D. Ratte

Lawrence D. Ratte'

I-41: Your position favoring dam removal is noted.

I-42: Comment noted. The FEIS, Section 2.7, includes a revised cost estimate for each alternative. Staff disagrees that cost:benefit analysis should be the determinant in this decision.

I-43: Comment noted.

7654 Alderson Road
Blaine, Washington 98230
April 6, 1991

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E., Washington, DC 20426

Dear Ms. Cashell:

I-44 I believe there is much to gain and little to lose by the removal of the Elwha River dams, but I believe the cost of doing so should be borne by James River II and/or those who profitted illegally from these dams all these years at the expense of the Lower Elwha Indians, the National Park and public. Building the dams were crass and callous crimes which should be expeditiously corrected. There removal would be a rare event, I think, and an inspiration to reverse some of the human induced storm of destruction to this once beautiful land which has occurred in such a relatively short period of our history.

Sincerely,

Harry Nelson

I-44: Your position favoring dam removal is noted.

Dear Ms. Cashell: 4/6/91

I-45 I am writing in regard to the DEIS issued by FERC concerning Glines Canyon (FERC No. 588) + Elwa (FERC No. 2683). I favor removal of both dams from the Elwa. Only removal of both dams will result in full restoration of anadromous fish runs to the Elwa and the ecological integrity of the Elwa portion of Olympic National Park. Thank you

Len Gardner
521 N. 74th St.
Seattle, WA 98103

I-45: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

Joan Johnson
605 5th AVE. N. #310
Seattle WA 98109
April 4, 1991

Dear Lois Cashell, Booth Gardner, Senators Adams and Gorton,

I-46

I am greatly concerned about the devastation of the salmon runs by the two dams on the Elwha River outside of Port Angeles in Washington. These dams were built without fish passage.

I was a resident on the Olympic Peninsula for six years (1978–1984). I looked forward each year to the salmon runs. The fish were so big and came in large numbers and had come such a long way to the streams near where I lived, driven by their awesome instinct to return to where they came from, their spawning ground, to produce the next generation. Nature is so wonderful. We need to preserve the miracles of nature. Towards the end of my six years living there I noticed a significant drop in the number of salmon

RESPONSES TO INDIVIDUALS

I-46: Your position favoring dam removal is noted. The decrease in salmon returning to the Elwha from 1978 to 1984 was probably mostly pink salmon. From 1979 to 1981, pink salmon runs declined and have remained low; however, pink salmon declines do not appear to be caused by hydroelectric activity on the Elwha River, because the entire region had a major reduction in pink salmon. No other stock appeared to show marked declines during this period.

I-46 con'd

that make it to the streams. We need to respect the salmon's spawning grounds by removing the obstructions on the rivers. Mainly the dams on the Elwha.

Please do all you can to remove the obstructions. By removing them now there is a better chance for the salmon to remain unextinct.

We are lucky to live in the northwest part of this country. Please lets do all we can to preserve the wealth of the natural world around us. It is a precious resorce for our spirits ~~ae~~ united to it. We are a part of this nature after all.

Sincerely,

Joan Johnson

COMMENTS OF INDIVIDUALS

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 Nl. Capitol St. N.E.
Washington, D.C. 20426

Reference: Project Nos. 588 and 2683.

I have read the DEIS for these projects, and have the following comments to offer.

I-47 The arguments for the removal of both the Glines Canyon Dam and the Elwha Dam are compelling. Neither dam should ever have been built. The Glines Dam is an intrusion on the integrity of Olympic National Park. Both dams have virtually destroyed a salmon run of immense value. The power produced by these dams could and should be replaced by power from elsewhere.

The sooner these dams are revoved the better.

Yours sincerely,
Joseph C. Toynbee

Joseph C. Toynbee
5908 So. Prentice
Seattle, WAsh. 98178

RESPONSES TO INDIVIDUALS

I-47: Your position favoring dam removal is noted.

Dear Ms. Cashell, 3/15/91 P-588 P-2683

I-48 Thank you very much for keeping in touch with me on the developments on the Elwha River issue (GLINES CANYON, etc) On January 16, 1990, I wrote a 3 page letter to the Federal Energy Regulatory Commission favoring the removal of the dams on the Elwha River so the river could return to its natural state. I won't be able to attend the meetings to be held on April 3 and 4 but I would appreciate having this postcard and my letter entered as public testimony on the issue. Please keep in touch. Thank you very much for your cooperation.

Sincerely yours.
George Riffero

I-48: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

Lois Cashell.
Federal Energy Regulatory Commission
WA. DC.

Dear Ms Cashell,

The EIS. for the Elwha Canyon &
I-49 E lwha hydroelectric projects Washington.
I support Removal of Both Dams.

Thankyou

Susan E. Cox.

RESPONSES TO INDIVIDUALS

I-49: Your position favoring dam removal is noted.

Lois Cashell
Secretary of the FERC
825 N. Capitol St. N.E.
Washington, D.C.
20426

I-50 I support your Environmental Impact Statement recommending removal of the Glines Canyon Dam (ref.588) and the Elwha Dam (ref.2683).

I-51 It is incomprehensible to me that a pulp mill continues to take precedence over what was once one of the greatest salmon runs in the lower 48 states.

In these times of reduced salmon spawns and endangered species, we are fortunate to have an answer to the problem concerning one river - free the Elwha. We should end the decades of cheap power that one company has profited from at the expense of a public resource so great as this one wild and fish producing river.

I-52 Clearly, the economic recession on the Olympic Peninsula would be lessened by the dam removal projects, as well as the future economic opportunities a healthy, thriving fishing and tourist industry will bring.

I-53 Only a strong federal commission recommendation will enable the people of Washington State to take back the ecology of the Olympic National Park. Please reverse 80 years of poor management. Make James River take down the dams.

Sincerely yours,

Denise M. Andrews

D. M. Andrews

Susan P. Rosenthal

Susan P. Rosenthal

I-50: Your position favoring dam removal is noted.

I-51: Comment noted.

I-52: Comment noted.

I-53: Comment noted.

COMMENTS OF INDIVIDUALS

Donald G. Bettger, O.D.
Doctor of Optometry

114 East 1st Street
Port Angeles, Washington 98362
(206) 452-2361

Forks, Washington 98331
(206) 374-2050

Member American Optometric Association

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SECRETARY
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The Contact Lens and Eye Care Clinic

March 8, 1991

Federal Energy Regulatory Commission
Office of Hydropower and Licensing
Attention Ronald McKitrich
825 North Capital Street N.E.
Washington, D.C. 20426

RE: Project 588 - Glines Canyon Dam
Gentlemen:

There seems to be a lot of effort on the part of certain environmental groups to push for the removal of dams, on both the Elwha and Glines Canyon. There is much talk for the need of restoring fish runs and for turning the river back to its natural habitat.

I-54 What few people seem to realize is that this whole issue can be catastrophic. This can be the first step in the removal of dams from all rivers in the entire United States. Success in the removal of one dam sets the stage for the need to remove other dams until soon, not one dam exists. Ultimately, very little has been gained and a great deal has been lost, primarily, suitable water supplies and suitable hydroelectric power. To remove the dams can very easily affect the water supply for the City of Port Angeles. The lack of power could have a very detrimental effect on one of our major businesses.

I-55 ITT Rayonier and Daishowa International have already been seriously impacted by the spotted owl and its impact on the timber industry. Add to that now the lack of power for Daishowa and interruption of clean water supplying both mills and we may find they can no longer profitably exist on the Peninsula. It is all a matter of what you invision the Peninsula to one day be. If you want this to be all Olympic National Park with no industry, only tourism, in a beautiful, natural habitat, then by all means, take out the dams. If you are interested in the welfare of these communities and the people who live here and in maintaining the business and industry on this Peninsula, then I encourage you not to remove the Elwha or the Glines Canyon dam. Fish runs can always be brought back, though it may be expensive to do so. Try first to restore the fisheries or rivers that do not have dams rather than experiment on rivers by removing dams where they now exist. If that plan works, then perhaps sense can be made out of dam removal.

Sincerely,

Donald G. Bettger, O.D.

DGB:gb

RESPONSES TO INDIVIDUALS

I-54: Your position opposing dam removal is noted.

I-55: Comment noted.

1000 Bean Road
Port Angeles, Wa 98362
March 1, 1991

Office Of Hydro Power and Licensing
825 North Capitol Street NE
Washington, D.C. 20426

Dear Mr. McKitrick:

I-56 The fact that anyone is even considering destroying two perfectly good dams west of Port Angeles is difficult for me to believe. These dams not only provide electricity, a modern wonder, but also reservoirs of pure water. Destruction of these beautiful dams would be counterproductive to civilization and completely irrational.

Sincerely,

A. M. Steigerwald

Allan M. Steigerwald, M.D.

I-56: Your position opposing dam removal is noted.

COMMENTS OF INDIVIDUALS

January 11, 1991

Federal Energy Regulatory Commission
825 N. Capitol Street, NE
Washington, DC 20002

Dear Sirs:

I-57 I strongly believe that the Federal Energy Regulatory Commission should not be allowed to re-license the Elwha and Glines Canyon Dams. As a U.S. citizen, it is important to me that the former fish runs be restored to provide for feeding our population. Doctors urge us to substitute fish for meat in order to provide nutrition with less cholesterol. Before they were dammed, the Elwha River provided the largest run of spawning salmon and trout in the Olympic Peninsula, among them the Chinook salmon which attains a weight of 80 - 100 pounds. The two aforementioned dams left such - and other species of salmon and trout - with only 5 of their original 75 miles of habitat.

I urge that the Dept. of the Interior be granted a re-hearing of its case, so that action in favor of dismantling the Elwha and Glines dams can be taken at once.

A copy of this letter has been sent to Representative Bruce Vento, Minn., Chairman of the Parks sub-committee, who has stated that "the Federal Energy Regulatory Commission's stance is a direct threat to the integrity of the entire National Park System".

Sincerely yours,

(Mrs. Israel) Bertha Ulian

Bertha Ulian

cc: Representative Bruce Vento

Bertha Ulian
30 Julio Drive, #447
Shrewsbury, MA 01545

RESPONSES TO INDIVIDUALS

I-57: Your position favoring license denial and dam removal is noted.

COMMENTS OF INDIVIDUALS

Gro Anna Buer
6215 Palatine Ave N
Seattle, WA 98103
March 22, 1991

Lois D. Cashell
Federal Energy Comm.
825 North Capitol ST. N>E>
Washington DC 20426

Dear Ms. Cashell,

I-58 I am writing to make my feelings known concerning the Elwha River Dam. The Elwha River, located on the Olympic Peninsula, Washington, should have both hydroelectric dams removed. The removal of these dams will restore fish migration in the watershed and the ecosystem within the Olympic National Park. You have asked for public opinion, so I want to make sure that my opinion and that of my husband, and countless friends are counted. Free the Elwa River!

Thank You. Sincerely, G Buer Bruce Williams

Gro Anna Buer and Bruce Williams

RESPONSES TO INDIVIDUALS

I-58: Your position favoring dam removal is noted.

Dear Mr Cashell

I-59 Please remove The 2 dams on The Elwha River in Olympic National Park in Washington State

These dams destroy native salmon and trout and are not wanted or needed in a National Park.

Yours truly

Pam Pritzl
4649 Eastern Ave N
Seattle WA

I-59: Your position favoring dam removal is noted.

JOHN E. EDISON
ATTORNEY AT LAW
5834 NE 75TH #B-204
SEATTLE, WASHINGTON 98115

TELEPHONE (206) 524-8766

To: FERC 22 March 91

Dear Sirs:

I-60 Please remove the 2 dams on the Elwha River in Washington State. These dams are destructive of fish runs and are not appropriate in a National Park. These dams represent a subsidy to a foreign timber company. As a recreational fisherman, backpacker, birdwatcher and frequent user of the Olympic National Park I believe these dams are unneeded eyesores. The time for them to go is now.

John E. Edsion

John E. Edsion

I-60: Your position favoring dam removal is noted.

DRAFT STAFF REPORT

COMMENTS OF INDIVIDUALS

Lois D. Cashell, Secretary   March 22nd, 1991
FERC

I-61 Madam: I strongly support the removal of all the dams on the Elwha River (WA). We must protect our salmon (and other fish) runs. The public must decide how to use public resources, not the FERC, nor the greedy companies. I ask that the Elwha River be returned to its natural state and the salmon runs. Thank you.

Resident of Washington State.
J. C. Harsh.

RESPONSES TO INDIVIDUALS

I-61: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

Port Ange

Mr. Ron McKitrick
F.E.R.C.

Dear Sir;

Had to leave the recent Port Angeles FERC E.I.S. meeting prior to an opportunity to spea[k]. Was able to talk to your fish passage contractor and will write him some thoughts soon too.

I-62 One oversight in your draft E.I.S. is fail[ure] to consider what impacts removal of lower E[lwha] dam could have on the U.S. 101 Elwha Ri[ver] bridge.

I contacted local State Highway Engineer [on] this subject. (Ray Mastell 206-457-~~4290~~ 429[...]

The 101 Elwha bridge was constructed in 19[...] thirteen years after the lower dam was bui[lt].

There was 13 years of heavy accumulation of river sentiments at the bridge site because G[lines] dam did not exist and too, the slack wat[er] of Lake Aldwell extended to the bridge site [at] that time as my memory recalls slack wa[ter] there in 1952 and photos (such as even earl[ier] photos in Aldwell's book indicate. These sentiments deposits continued for 13 years con[...] until 101 bridge was constructed (and since t[...]

Anyway in checking with the above listed engineer & his blueprints indicated that the [...] (surrounded by river flow) westerly bridge support pier bottom to be on [...] with the 1927 river bottom. Underneath th[e] large support are couple concrete piling of th[...] diameter sunk to an unknown depth. Ra[y] planned to check more with Olympia headqua[rters]. Ray had no information as to the original riv[er]

RESPONSES TO INDIVIDUALS

I-62: The Highway 101 Bridge is located at River Mile 7.6, which is in the backwater of Lake Aldwell and on the upper end of the Aldwell delta. About 10 to 15 feet of sediment has been deposited in the area. The deposited sediment would be loose, sandy gravel to gravelly sand. A bridge the size and weight of the Highway 101 Bridge could not be supported on this loose saturated deposit. Review of photographs of the bridge, taken during the Commission staff visit, indicates one abutment is clearly on the bedrock cliff in the area. It is unclear in the photograph if the other abutment is on rock or supported by deep piles, which would need to penetrate much deeper than the 10 to 15 feet of shallow, loose sediment deposited in the reach. If removal of Elwha dam were selected, final design studies for the project would include assessment of civil works along the river.

I-62 cont'd

channel bottom elevation at that point prior to placement of lower dam.

Should FERC order lower dam removed, ra[illegible] erosion could be cause for bridge failure in [illegible] opinion.

To further compound this situation, the la[illegible] Oscar Hansen whom told me much history of the Indian Creek – Elwha River area, once to[illegible] me that immediately upstream of the bridges prior to lower dam, there existed a huge mi[illegible] stream boulder now long since buried in [illegible] gravel. There was no evidence of the rock w[illegible] I first rowed upstream of the bridge in 195[illegible]. If lower dam removal means rapid erosion [illegible] this river section and eventual exposure of [illegible] boulder which is certain to divide half the river flow against the first westerly bridge support and could cause bridge collapse especia[illegible] during back to back floods.

Should river channel east of rock become clogged with logs etc. perhaps entire river flow could quickly erode bridge support rock forcing entire flow to bridge support.

This bridge is extremely important to o[illegible] county as majority of our timber productio[illegible] routed this way.

Our other highway to western Clallam C[illegible] has been closed since Nov. 1990 and was clo[illegible] to other slides for 6 months earlier during [illegible] and has been closed for several prolonged per[illegible] during earlier years.

~~[illegible]~~ Other alternate routes are either washed out or within severe snowfall zone

COMMENTS OF INDIVIDUALS

I-62 cont'd

would require additional rock surfacing to provide low elevation gradient road and one lane.

I believe the Glines dam powerlines which cross the river at bridge site prevents use large cranes from atop bridge. Should lower dam be removed the state would probaly have to build cofferdam around bridge support and pour larger footing around and under support.

The decision facing FERC toward site dam retention or removal is extremely difficult. A more difficult task awaits your agency in twenty years time on the Cowlitz River dams.

I-63

Unless we remove the dams and all non Indians leave, the Elwha can never be fully restored as to fisheries. Even then, some stocks like the early coho are long

Dam retention (and hydro jobs) plus dec levels of salmon + steelhead certainly is (Coho + chinook) satisfactory to me.

I-64

To prevent further delay of salmon passage into upper Elwha, I would pref to have a FERC decision where everyone is somewhat satisfied with outcome.

If FERC orders both Elwha dams remov am certain James River will immediately file lawsuit. My knowledge of Elwha history tells me James River has an extremely strong case against both the feds + State.

RESPONSES TO INDIVIDUALS

I-63: Your position opposing dam removal is noted.

I-64: Comment noted.

COMMENTS OF INDIVIDUALS

I-65 FERC failed to address gravel transfer around the dams to both prolong life of reservoirs and enhance spawning beds.
If the dams remain, I feel confident myself and others can convince our local state legislator to have the state fund such project with some assistance from our city which owes the river far more than the land the city permitted construction of Elwha Rearing Channel upon.

I-66 According to friend Bruce Sampson (a Clallam) his aunt once owned the land containing fish facility, industrial waterway and more recent city water domestic intake. The city harassed his aunt constantly (also county game warden) until she gave up in frustration and sold for some relief and peace.
I see no problem protecting the city industrial intake transferring gravel around lower dam. Installation of low prefab concrete dam well above intake to trap gravel and city to spend day or two per year excavating and transfer for deposit into river below their rock barrier dam below the intake.

I-67 The city renewed industrial water contracts last year for same price in effect 30 years ago, but has seen fit to often raise our garbage collection fees etc.
Numerous leaks for years in industrial waterline deprived the river of some water including [illegible]

RESPONSES TO INDIVIDUALS

I-65: Gravel transfer will have no direct effect on the life of the projects because they are run-of-river projects. Therefore, lost storage is not a factor of power production as it is in many other hydroelectric projects.

Transferring gravel from above the projects to the middle and lower reaches to enhance spawning beds is not considered cost effective. Current estimates of providing gravel in proportion to the amount carried annually by the stream is $500,000 to $700,000 annually, when gravel is supplied from a local gravel pit. Using gravel from the river and deltas above each of the projects has not been costed but would be more expensive than using gravel from the gravel pit operation. Additional impacts would occur from such an activity including increased suspended sediment and turbidity resulting from upriver activity. Without commitment of funds to do such an activity, the staff does not believe it is appropriate to make this a recommended activity for the applicant because of the high cost and additional impacts.

I-66: Under dam retention alternatives, the licensee would have no responsibility for protecting the potable water intake and fish rearing channel. This would remain the responsibility of the local officials and water users. Under the dam removal alternatives, however, the increased sediment load would be of such a magnitude that new measures would be needed to maintain domestic water supplies both during removal of the dams and for several years thereafter, and to maintain water of sufficient quality for fish rearing during the period of dam removal. Under the dam removal scenario, five new Ranney wells would be installed and the diversion dam and fish rearing channel would eventually be abandoned (see Section 4.2.2.3).

I-67: Comment noted.

COMMENTS OF INDIVIDUALS

I-68 Until recently when the ITT-Rayonier Mill closed for couple weeks late Summer early Fall, that mills water allocation was discharged into the old log pond beside the Daishowa America Mill. Often salmon (likely Elwha) would be attracted to the pipeline discharge point. Water is now returned to river. The log pond outlet connects to our harbor.

I-69 For years a large leak (several C.F.S.) in the line where it crosses lower Dry Creek and is exposed, discharged water into lower end of Dry Creek which attracted chum salmon which were probaly Elwha. Chum salmon (or others) probaly aren't native to lower Dry Creek as that stream is subject to often "freeze dry up" during late Fall or early Winter cold snaps. So, reproduction probaly failed. Have trapped raccoon + fox along that area in past years and that's my observation. This only one of numerous reasons for decline of Elwha salmon.

I-70 The late Ernie Brannon whom worked for W.D.F. for fifty years of which much of that time here, once stated his supervisor wanted him to capture the large salmon and kill the small ones. Ernie probaly listened but didn't act and I certainly didn't ask. The fisheries program in this state is strange. Didn't make since during 1975 for W.D.F. to rebuild chinook

n the Elwha

RESPONSES TO INDIVIDUALS

I-68: Comment noted.

I-69: Comment noted.

I-70: Comment noted.

COMMENTS OF INDIVIDUALS

I-70 cont'd
stocks and completely ignore the Elwha pinks which are now near extinction.

I-71
When FERC has prepared final Elwha decision, would be pleasing for that news to first be made public either over a Seattle T.V. station or public meeting here plus an explanation for its decision.

If the dams remain expect your staff to be on hand when the Elwha dam fish ladder is operation to view this ~~historic event~~ historical event.

Thanks
Buck Adamire

RESPONSES TO INDIVIDUALS

I-71: Comment noted.

COMMENTS OF INDIVIDUALS

2416 E. McGraw
Seattle Wa 93112
5 Apr 91

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 N. Capitol St. N.E.
Washington, DC 20426

Dear Ms Cashell:

I-72 I am a long-time resident of Seattle who has experienced the marvelous beauty of the Olympic Peninsula and the national park there I want to express in the strongest possible terms the request that the two dams on the Elwha River--the Elwha and the Glines Canyon dams--be removed. I have seen these dams and they are a blight on the natural beauty of the area. But perhaps most importantly both, and illegally so, block passage of spawning salmon and trout. It was a real shame that these dams were built in the first place, but it seems to me that now is the time to save as much as we can.

Sincerely,

D. W. Welti, M.D.

Copies to Governor Gardner, Senators Adams and Gorton, and Representative McDermott

RESPONSES TO INDIVIDUALS

I-72: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

PPOJECT 2683 & PPOJECT 588

Keith Peters
471A Hotsprings Rd.
Port Angeles. Wa
98362

March 1. 1991

Ronalo McKitrick
Feoeral Eneray Pegulatory Commission
Office of Hyore Power & Licensing
825 North Capitol Street NE
Washington. D.C. 20426

Dear Mr. McKitrick:

I-73 I feel the two dams on the Elwna Piver should not be relicensed. and then promptly removed. Few rivers in the Pacific Northwest have the salmon rearing capability that the Elwna does. The Elwna is one of the purest rivers in America yet it's salmon runs near extinct.

I-74 Removal of the dams and re-establishment of healthy salmon runs in this river would be a tremendous economic benefit to the north Olympic Peninsula. Due to a decrease in the forest products industry we need this rivers salmon runs far more than the hydro power. Re-establishment of salmon and steelhead runs in the entire river would greatly increase the recreational and commercial fishing industry and tourism. clean industries this area needs.

I-75 Most rivers are loosing the clean unspoiled habitat in their watersheos necessary for healthy fish runs. The Elwha is untouched and pristine and will be forever. All she needs is the removal of two concrete monoliths.

You and I are just mortals living on this planet for hopefully eighty or so years. This river has been around for millions of years. She deserves our greatest attention and respect. She has been in bondage for most of this century and now deserves to be set free. She has served her master well. It's time to return her dignity and salmon runs.

Pequiring removal of the dams would be one of the greatest contributions we could make towards preserving the natural environment in this country.

I-76 My advise is to lower the water levels behind the dams gradually. remove the dams and let nature do the rest. I guarantee you the river will return to it's natural state within two years which is equivalent of about four flood

RESPONSES TO INDIVIDUALS

I-73: Your position favoring license denial is noted.

I-74: Comment noted. The FEIS, Section 4.2.8.2, points out that both commercial and sport fishing for several species would have to be reduced for at least several years, and sometimes permanently, in order for the runs to recover.

I-75: Comment noted.

I-76: Comment noted. Staff disagrees, however, that the river would return to its natural state in just two years.

COMMENTS OF INDIVIDUALS

RESPONSES TO INDIVIDUALS

I-76 cont'd

stages. The lower river needs the sand and gravel and the silt will rapidly flush out. If the sediment load causes threading so be it. Threading of a river creates more habitat for juvenile salmon and wildlife in general.

Let us join forces and make the Elwha River a model river to be proud of and for future generations to cherish and respect forever.

Warmest regards,

Keith Peters

COMMENTS OF INDIVIDUALS

PROJECT 2683
PROJECT 588

March 5,1991
2080 Levig Rd.
Port Angeles, WA
98362

Federal Energy Reg. Commission
825 North Capitol Street NE
Washington,D.C.

ATT: Ronald McKitrick

I-77 Removel of both the Elwah dams will cause more power to be sent to Port Angeles,WA. to run the mills.

We are now experiencing a housing boom in the Sequim area with farms being sub-divided and city like dwellings-more people are moving into both areas,causing more power useage!

Will the BPA supply this power needed without jeopardize-the mills?it is our liveli-hood,and without the mills,this town would cease to exist.

I-78 Also the Elwah tribe wants the dams removed-I wonder who will cry out the most when their land on the reservation is flooded and homes surrounded by water???? Who will go in and put in dikes,and who will spend out the money to do this? (Surely not the Wildlife agency or the National Park,or the fishermen who want the dams removed)

We had in the Sequim area a loss of bridges-homes,land flooded. The lower Elwah tribel land was also flooded in areas. Each yr. as the rains come it get worse!

I have yet to see in any newspaper articles mentioning about this hazard?

Any comment??

I am a life-long resident of this town-65 yrs.

Mrs Darlene A. Ford
Mrs Darlene A. Ford

RESPONSES TO INDIVIDUALS

I-77: Staff does not believe that providing power to residents in the Sequim area would preclude BPA from also supplying power to the mill. However, each additional demand on the regional power supply system will eventually require additional generation or conservation so that all power supply demands can be met (Section 2.7).

I-78: The EIS discusses the need to raise a portion of the levee to protect local areas fr flooding in the event of dam removal (Section 4.2.1). The cost of raising the lev is included in the staff's cost estimate for the dam removal alternative. It has not been determined, however, who would pay for removing the dams and raising the levee.

COMMENTS OF INDIVIDUALS

Albert A. Haubrich
1024 West 8th St.
Port Angeles, Wa. 98362

March 11, 199

Ronald McKitrick

I-79 I am writting in opposition to the removel of the two power dams on the Elwha river, here in Washington, State.

I-80 Removel of the Dams will not restor the so called giant Salmon that some peop say existed prior to their construction. Any improvement in the fish runs would be harvested by the many foreign fishin fleets that rape our fish runs off our coast.

I-81 The problem of silt will be a sidimintation problem for the City of Port Angeles water system for years.

I-82 If the environmentelests succeed i having these Dams removed, it will cause a domino effect across the nation. All small power Dams and irrigation systems will be removed too,

I-83 I say relicense the Dams, then spend some money to improve fish runs in other streams near by.

Sincerely

Albert A. Haubrich

RESPONSES TO INDIVIDUALS

I-79: Your opposition to dam removal is noted.

I-80: Comment noted. As noted in the EIS, restoration of the Elwha fish runs wou require reductions in fish harvest both in the river and offshore.

I-81: Comment noted. The EIS (Section 4.2.2.3) recommends that the City be compensated for any increased costs incurred to preserve the quality of the C water supply in the event of dam removal.

I-82: Comment noted.

I-83: Comment noted.

COMMENTS OF INDIVIDUALS

MARCH 12, 1991

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF HYDRO POWER AND LICENSING
ATTN: RONALD MCKITRICK
825 NORTH CAPITOL STREET
WASHINGTON, D.C. 20426

PROJECTS 2683 AND 588

SIR:

THIS IS MY SECOND LETTER TO THE COMMISSION REGARDING THE POSSIBLE REMOVAL OF THE LOWER ELWHA AND/OR GLINES CANYON DAMS. MY FIRST WAS OVER A YEAR AGO FOLLOWING THE FERC HEARING ON THE MATTER IN OUR HIGH SCHOOL GYMNASIUM.

WE HAVE BEEN AN INTERESTED PARTY TO THE PROCEDINGS DUE TO OUR HOME AND LAND BEING SITUATED ON THE ELWHA RIVER BETWEEN THE TWO AFOREMENTIONED DAMS, NEAR HIGHWAY 101. WE WERE NOT INFORMED ABOUT THE LICENSING PROCEDURE AND CONTROVERSY WHEN WE PURCHASE. FOUR YEARS AGO.

I-84 THE ENVIRONMENTAL IMPACT STUDY WE RECEIVED IN THE FALL OF 1989 APPEARED TO HAVE ADDRESSED THE ISSUES FROM ALL SIDES EXCEPT PRIVATE PROPERTY OWNERSHIP, WHICH COULD BE AFFECTED ADVERSELY FOLLOWING REMOVAL OF THE DAM(S), IF SUCH BECAME THE DECISION. MY VERBAL STATEMENTS AT THE HEARING AND SUBSEQUENT LETTER RAISED THIS TOPIC AND, TO DATE, WE HAVE RECEIVED NO COMMUNICATION. NOT EVEN AN ACKNOWLEDGEMENT OF THE RECEIPT OF THE LETTER.

I-85 IT APPEARS TO US NO ONE CAN GUARANTEE THE POSSIBILITY THAT OUR PROPERTY WILL NOT BE NEGATIVELY AFFECTED. IF THE DAMS ARE REMOVED (ONE OR BOTH), AND THE WATER LEVEL RISES SIGNIFICANTLY TO ERODE THE LAND, WASH OUT THE WELL OR WELL HOUSE OR WORSE YET

I-86 DAMAGE THE HOUSE AND THREATEN OUR LIVES, WHO OR WHAT AGENCY WOULD BE RESPONSIBLE? IS THERE A PLAN FOR THE GOVERNMENT TO

I-87 EXERCISE ITS RIGHT OF EMINENT DOMAIN AND TO PURCHASE THE PROPERTY FOR FAIR MARKET VALUE?

I-89 WE ARE NOT OPPOSED TO RESTORING FISH RUNS ON THE RIVER. JUST WANT SOME STRAIGHT ANSWERS TO WORRYSOME QUESTIONS.

PLEASE SEND US THE LATEST COPIES OF THE EIS REPORTS.

SINCERELY,

RESPONSES TO INDIVIDUALS

I-84: Comment noted.

I-85: The Sturm property is located in the area of Little River. This is in the backwater influence of the reservoir in the upper part of the Lake Aldwell delta. If the Elwha dam were removed, the river channel would degrade between 5 and 10 feet. If the Glines Canyon dam were removed, leaving the Elwha dam, the channel could aggrade causing greater flood heights and possibly putting the property structures at greater risk in floods greater than about 20,000 cfs. If both dams were removed, the river would degrade an estimated 5 feet.

I-86: The responsible agency would be that agency charged with removal of the dams.

I-87: There is no such plan because anticipated adverse impacts of the type suggested by the comment are negligible.

I-89: Comment noted.

COMMENTS OF INDIVIDUALS

3-19-1991

Federal Energy Regulatory Commission
Office of Hydro Power and Licensing
att: Ronald McKittrick
825 N. Capitol St. N.E.
Washington D.C. 20426

Dear Mr. McKitrick:

I-90 We are very much against removing the two Dams on The Elwha River, because they are making clean, safe and cheap Power. it would also cost a lot to take the Dams out.

I-91 There would be more fish in other Rivers if The Indians didn't put nets at the mouth of Rivers.

Sincerly

Fred and Vera [illegible]

RESPONSES TO INDIVIDUALS

I-90: Your opposition to dam removal is noted.

I-91: Comment noted.

9230 7th Ave. NW
Seattle, WA 98117
March 28, 1991

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol St. NE
Washington, DC 20426

Dear Lois Cashell:

I regret that I am unable to testify at the FERC public hearing on the Elwha dams to be held in Seattle on Thursday evening, April 4. Please accept this letter in lieu of public testimony.

(FERC# 588) (FERC# 2683)

I-92 I enthusiastically support the removal of the Elwha and Glines Canyon dams. We build dams claiming that hydropower is a "renewable" resource, while ignoring the sometimes irrevocable damage done by dams to the natural environment. That damage is not just to fish but to the entire surrounding habitat that depends on the river: eagles, bears, and numerous other species. It is a double tragedy when this damage is allowed to happen in a national park. Hopefully some of the damage done by the Elwha dams can now be undone - by their removal. I am convinced and encouraged by the report in the DEIS that this can be done while dealing with sediment in an environmentally sound manner. I believe this is the only way to restore the fish runs, the surrounding ecosystem, the spiritual value of free-flowing rivers, and the integrity of the Olympic National Park.

I-93 I have duly noted the finding in the DEIS that the dams cannot be expected to produce as low cost electricity in the coming years as in the past. However, I live in and love the Northwest because I treasure the environment, not the low cost of electricity. I would be willing to pay more for electricity or conservation measures if necessary to restore and maintain the wonderful rivers and forests that we have here. Many businesses and industries in Japan and Europe pay far more than we do for electricity and still manage to have thriving economies that compete successfully in international markets.

I hopefully await a decision to remove the Elwha and Glines Canyon dams.

Sincerely,

Beth Blattenberger

cc: Gov. Booth Gardner
Sen. Brock Adams
Sen. Slade Gorton
Rep. Jim McDermott

I-92: Your position favoring dam removal is noted.

I-93: Comment noted.

COMMENTS OF INDIVIDUALS

Ronald McKitrick
Office of Hydro Power and Licensing
United States Federal Energy Regulation Commission
825 North Capitol Street North East
Washington, D.C. 20426

Dear Sir:

I-94 This letter is in regard to the proposed removal of two hydro-electric dams now operating on the Elwa River in northwest Washington State. The removal of these dams at a time of increasing energy demand and decreasing sources of new clean power generation is not logical from an economic, ecological or recreational standpoint. These facilities generate clean pollution free energy, they enable the Daishowa America Paper mill that uses that power to be competitive in the demanding Pacific Rim Paper market, and Lake Mills, a very popular recreational area, is formed by the upper of these two dams.

I-95 The logical thing to do: Leave these dams in place. The Bonneville Power Administration Deputy Administrator spoke to the Port Angeles Chamber of Commerce on April first of this month. His message:"rapid growth in the Pacific Northwest is taxing Bonneville Power to its limits, more power generation along with conservation programs will be needed to prevent a serious energy shortfall in the next 5 to 10 years" This, clearly, is not the time to go ripping out successful, expensive hydro-electric dams at taxpayer expense and spend further millions in "land restoration", and then turn around and ask the tax payer to replace the lost generating capacity with higher taxes and utility bill payments. It just does not make sense to me.

I-96 As for the restoration of the Elwa River Salmon run, I think the Elwa can produce electricity and Salmon, through the use of innovative technology. The Eicher Screen recently installed at Elwa dam is example of new technology to enable fish runs and hydro power to successfully co-exist. This Eicher screen program is so new that its success for the long run can not yet be judged. Why don't we give it a chance?

I-97 The removal of these two dams poses a very serious problem to the Elwa ecosystem: Over the last 77 years since the completion of the lower Elwa dam, vast amounts of glacial till and sediment have settled on the bottom of what is now Lake Aldwell. The fine rock flour and clay silt in this lake bottom will pose a monumental, expensive, and un-neccesary public works boondoggle to whatever agency attempts to remove it. The exposure of thousands of tree stumps as a result of draining Lake Mills and Lake Aldwell, will require yet more public works money, vast amounts of federal tax dollars, to restore this exposed area to a tolerable appearance. thousands of large trees were logged off in these two valley areas for miles up river, the vast area of stumps and sediment behind both dams will be monumentally expensive to clean up. No project of the type has ever been attempted, it is an environmental"pandora's box" that no one can fully estimate the real cost, in tax dollars, to resolve.

I-98 The devastating siltation of the Elwa River that will result from these so called "restoration programs" will also damage the new water intake system for the City of Port Angles, recently installed at a cost of millions of dollars, in the Elwa river below both dams. As a 40 years resident of Port Angeles, Washington, I feel threatened by the potential loss of local jobs, clean energy, Lake Mills recreational activities, and a degradation of our drinking water, all as a result of poor judgement on the Federal level. I urge the Federal Energy Regulation Commission to leave these dams alone. We need energy, jobs and clean drinking water, not the counter-productive destruction of two clean well run hydro-electric dams. If its not broke, don't fix it. Please use your best judgement to prevent this dam removal debacle. With the national deficit currently running at an all time high, there surely must be a better use of millions of our tax dollars. Thank you for your time and consideration.

Darwin Gearey
Sincerely, Darwin Gearey
130 West Third Street
Port Angeles, Washington 98362

RESPONSES TO INDIVIDUALS

I-94: Your position opposing dam removal is noted.

I-95: Comment noted.

I-96: Comment noted.

I-97: Comment noted.

I-98: Comment noted.

April 2, 1991

Ms. Lois D. Cashell
Secretary, Federal Energy Regulatory Commission
825 North Capitol St. N.E.
Washington, DC 20426

Dear Ms. Cashell:

I-99 I am writing to express my support for the removal of the Elwha Dam and the Glines Canyon Dam, both located on the Elwha River of Washington State's Olympic Peninsula. This is a unique region of great natural beauty. The Elwha River watershed drains a large part of the Olympic National Park, which includes some of the last remnants of temperate rainforest in North America. Here, within two hours of downtown Seattle, one can view moss-laden forests of ancient trees, the greatest density of glaciers in the lower 48 states, spectacular mountain peaks, and rushing rivers. These features have drawn hundreds of thousands of visitors to witness a landscape unlike anything else in North America.

But the vision is flawed. The Glines Canyon and Elwha dams have inflicted an ecological challenge to the integrity of the landscape. Their ecological effect is two-fold. **First**, the dams prevent the movement of fish to and from the sea. The failure of these dams to provide any provision for fish bypass has resulted in

I-100 the extinction of legendary runs of salmon, and the near extinction of others. **Second**, by obstructing the natural runs of salmon and other fish, the dams have severed a vital link in the flow of energy and nutrients between the terrestrial and the marine system. Healthy rivers carry a vast pool of nutrients down to the sea and provide a pipeline for anadromous fish, like salmon, which on their return to spawn are consumed by eagles, bears, and many other

I-101 animals. This cycling of resources is critical for the survival of all biological systems. The dams break the cycle. Nutrients washed from the forest are stalled behind the dams in the sediments of artificial lakes, unavailable to the salmon that could bring them back upstream. The result is that **all of the systems degrade.** There are fewer salmon, and fewer salmon-eating eagles-- a decline in the populations of all plants and animals that depend on the efficient cycling of nutrients.

I-99: Your position favoring dam removal is noted.

I-100: Comment noted.

I-101: Comment noted.

I-102 Salmon are the critical conduit for exchange between the terrestrial and aquatic systems, and are, therefore, the best indicators of the health of these systems. It is clear that on the Elwha the diagnosis is not good. The only effective cure is to remove the dams, restoring the exchange of resources between systems, and the biological integrity of one of our country's greatest national parks.

I-103 I urge you to support the removal of the dams on the Elwha. They have exacted an ecological cost that is no longer acceptable by a public which values the few remaining wild places.

Sincerely,

Douglas W. Schemske, Ph.D
407 N. 42nd St.
Seattle, WA 98103

I-102: Comment noted.

I-103: Comment noted.

BEN PALZER REALTY

"Gentle" Ben Palzer – Broker
127 E. First, SW Falls Mall – Port Angeles, WA 98362
Work (206) 452-4404, Home (206) 928-3725

April 22, 1991

F.E.R.C.
825 Capitol St. N.E.
Washington, DC 20426

Attn: Mr. S. Ronald McKitrich:

Dear Mr. McKitrich:

I-104 As a member of the Port Angeles Board of Realtors, I am opposed to removal of the Lower Elwha and Glines Canyon Dams for the following reasons:

Removal of the dams would result in:

I-105

1. Destruction of long-established habitat for migratory water fowl, rare birds of prey (including the spotted owl), beaver heron, otter and anadromous fish.
2. Destruction of designated wetlands.
3. Destruction of two pristine uninhabited recreational lakes.
4. Unknown repercussions on the Port Angeles domestic and industrial water and hydro-electric supplies. Why jeopardize domestic water and hydroelectric supplies when other areas of the Pacific Rim are suffering water and power shortages!
5. Unknown flooding impacts on private properties throughout the Elwha basin.
6. A negative economic impact on the Port Angeles community in the areas of fisheries, employment and tourism.
7. Poor stewardship of public money and trust. Restoration of the salmon runs can be accomplished without creating the unpredictable economic and enviromental consequences of dam removal. According to some authorities, there is a direct correlation between the decline in the salmon fishery statewide and the 1972 Judge Bolt decision. For example, the Dungeness River has experienced a fishery decline similar to the Elwha and the Dungeness has no dams! As long as native Americans continue unrestricted netting at the mouths of all major rivers, the Department of Fisheries can only speculate on any restorative measures with or without dams. The sad fact is that the only study (by Milton Griffing using FERC EIS numbers) correlating dam removal costs versus increased fish production, shows that the actual cost of producing $1 out of someone's pocket.
8. Problems in regard to sediment removal including filtration of Port Angeles, Dry Creek and other domestic water supplies, sediment disposal and destruction of exisiting fishery due to high sediment levels during dam removal and an extended period thereafter.
9. Loss of recreational use of Elwha Basin for a number of years including loss of access to Olympic Hot Springs, Boulder Lake, Appleton Pass and all points reached from Whiskey Bend.
10. [illegible]

RESPONSES TO INDIVIDUALS

I-104: Your position opposing dam removal is noted.

I-105: Your reasons for opposing dam removal are noted.

I-106 It will continue to be our concern that the FERC EIS made no economic projections for the fisheries loss during dam removal or artifically supporting the existing salmon runs during dam removal.

I-107 By FERC'S own admission, the socioeconomic impact was not a primary objective of their EIS and consequently the impact on the surrounding community has been inadequately addressed. The focus of the EIS was on saving fish, at any cost. We feel people are more important than fish.

I-108 We are gravely concerned about the FERC's continued reluctance to convert dam removal impact to dollars and cents in a format meaningful to the taxpayer/voter.

Since it is patently absurd to think James River will pay for the removal, it is imperative that we get realistic about who indeed is going to pay. That question needs to be addressed up front!

Sincerely,

BEN PALZER REALTY

Ben Palzer
Broker

cc: City of Port Angeles
Mr. L. Gaydeski
Ms. D. Duncan
Mr. D. Cameron
Mr. J. Hargrove
Mr. P. Conner
Mr. E. Jones
Mr. A. Swift
PUD Commissioners

I-106: The FEIS, Section 4.2.8.2, provides additional information about the value of th fish harvest under existing conditions and under the dam removal alternative, anc also describes more explicitly that harvests would have to be greatly reduced duri the recovery period.

I-107: Comment noted.

I-108: The FEIS, Sections 5.4 and 5.5, outlines the total cost of each alternative and presents several implementation options. The staff does not have sufficient information at this time to determine who would pay for dam removal if that alternative were implemented.

Attn: Public Affairs Office
U.S. Dept. of Energy
Bonneville Power Admin.
P.O. Box 3621
Portland, Oregon 97208-3621

4/6/91.

Attn: Public Affairs Office

I-109 In regards to the controversy over the Salmon being injured, the People living near the Elwau River. Want the Dams on this river torn down. But they do not realize one thing. the more people who move here to the Pacific North-West, We are going to hav to have more Hydre-Electricity, more powerful Turb: And also a better solution would be to have specia: tunnels say 6 inches high, 250 miles long so the Salmon are not injured. Port-Angeles, Communities near the River rely on these Dams to power there homes, Pulp-Mills , other industry also. Lowering water levels on B.P.A. constructed Dams is only going to cost the Utility Paying Customer more mone

Sincerly,

I-109: Your position opposing dam removal is noted.

21 April 1991

Re: "Elwha (FERC #2683) + Glines (#588), Hydroelectric Projects, Operation + Maintenance, License, Elwha River, Washington State."

Dear Honorable Public Servant,

I-110 A friend + I have paddled our kayaks from the headwaters of the Elwha River to the upper reservoir...... When a living river meets a dam, it dies – like a blocked artery.... heart attack, and the entire Earth goes deeper into sickness, coma, from our short sighted human-centered intervention.

Life is diversity, interconnectedness. We need wild rivers and the creatures they support. We need to regain the lost Salmon runs.

We need to rethink our industry; to radically restructure our energy policy so that it resonates with nature instead of resists it.

Man is not separate from nature. "What befalls the Earth, befalls man." Nature will reduce all the dams to sand in time, but here is a chance to do a good deed now and to free a living river.

Please register my comments in favor of removing above mentioned dams.

Thank you

Jordan Van Voast
4030 Whitman N.
Seattle WA 98103

91 APR 29 AM 10:13

I-110: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

James A. Thompson
808-21st St. #351
Bellingham, WA
98225

Lois Cashell
Washington, D.C.

Dear Ms. Cashell,

I-111 I am in favor of the removal of both the Elwha Dam and the Glines Canyon Dam on the Elwha River of the Olympic Peninsula, for several reasons.

I-112 The presence of an industrial facility inside a National Park is incompatible with my conception of a park's character. Olympic National Park is a wonderful example of what nature does without too much interference from humans. The dams are an example of misguided interference with nature and the bad consequences that result.

I-113 One of these results is the complete loss of the many runs of salmon and anadromous trout from the Elwha. This is a loss to nature and humans, in addition to being contrary to Washington state law.

I-114 Furthermore, because the dams are old and require expensive maintenance to meet the conditions of their license renewal, there will soon be no economic advantage to keeping these dams.

For these reasons, I support the complete removal of these dams.

Sincerely,

James A. Thompson

RESPONSES TO INDIVIDUALS

I-111: Your position favoring dam removal is noted.

I-112: Comment noted.

I-113: Comment noted.

I-114: Staff disagrees that there will be no economic advantage to retaining the dams. As indicated in Section 2.7.3, the cost of power produced by the projects would continue to be lower than the cost of power purchased from other resources. The cost of maintenance was included in that evaluation.

March 26, 1991

To: Lois D. Cashell
Secretary, Federal Energy Regulatory Commission
825 N. Capitol St. N.E.
Washington D.C. 20426

From: Joseph P. Barton
Member, Olympia Chapter Trout Unlimited
422 Alonna Pl. N.E.
Olympia, Washington 98506

Dear Mrs. Cashell,

I-115 I would like to express my support for the removal of the Elwha and Glines dams on the Elwha river, Washington state. Both dams have served their usefull life in providing energy needs. It has been very unfortunate of the environmental impact these dams have created for native fish runs once enjoyed by many. As a new century draws near, we are being more perceptive to the needs of the community in all interests possible. Yet there is always a hidden drawback to todays perceptions resulting in tomorrows problems. With carefull planning and participation from many, maybe we can organize our thoughts better and anticipate problems that may arise in the future. Please consider my support for the removal of the dams. Help us restore what once was a pride that Washingtonians cherished.

sincerely,
Joseph P. Barton

cc. Wash. Gov. Booth Gardner
Sen. Brock Adams
Sen. Slade Gorton
Rep. Jolene Unsold

I-115: Your position favoring dam removal is noted.

Thomas E. Pansky
2021 S.W. Main St., #63
Portland, Oregon 97205

April 20, 1991

Secretary
Federal Energy Regulatory Commission
825 N. Capitol St., N.E.
Washington, D.C. 20426

P- P-

RE: Docket Nos. 588 & 2683, Elwha and Glines Canyon Dams

Dear FERC:

I-116 After reviewing your Draft Environmental Impact Statement on the above referenced projects, I am writing to request that you support the removal of both dams and the restoration of the magnificent Elwha River canyon and its plant and animal populations and habitats.

Please read "Mountain in the Clouds" by Bruce Brown. It gives a magnificent account of what this ecological community looked liked before the dams.

Given the plight of anadromous fish in the Northwest these days, what a great opportunity to see if we can't restore what we have destroyed.

I-117 Of course, I also support having the Bonneville Power Administration help pay the costs to achieve greater electric efficiency at the plants currently served with power from the dams.

I-118 The corporations that built those projects have amortized all their costs. The waters belong the all the people. I do not feel the corporations have a "right" to expect those plants will remain forever in our river. Remove the dams.

Sincerely,

Tom Pansky

Tom Pansky

I-116: Your position favoring dam removal is noted.

I-117: Comment noted.

I-118: Comment noted.

4 April 1991

Lois D. Cashell
Secretary, FERC
825 North Capitol St. N.E.
Washington, DC 20426

Dear Commissioners:

Since I am unable to attend the 4 April Public meeting in Seattle concerning dam removel on the Elwha river, I am sending written testimony.

I-119 Basically I believe that both dams upon the Elwha must be removed, so that the watershed can be restored. From what I understand from local longtime area residents, the historic Chinook and "pink" salmon runs can't be restored without dam removal. Dam removal will guarantee passage of certain salmon runs to their spawning grounds upriver, will restore gravel beds needed for spawning of other salmon runs, and will allow migration of smolts downriver to the sea. I have both fished and hiked along the Elwha and from my personal experiences I passionately feel that if these dams are not taken out now and the restoration process begun soon, that the diminishing genetic pool of certain wild salmon runs means extinction for their species.

I-120 From previous hearings and reading the draft Environmental Impact Statement, I understand that dam removal is technically feasible, provided that political and economic will to do so exists. From my own conversations with members of Friends of the Elwha, the Elwha tribe and small business people in the Port Angeles area, I believe public support exists for damn removal and restoration. And I am confident that the public who uses the Elwha River watershed and fishes the River system do have the will to politically and economically perservere.

I-121 I believe that the removal of the dams is economically feasible for the Daishowa America pulp mill which receives the generated electrical power from them and will not adversely effect their operation, nor cause loss of jobs. The fact that the Glines Canyon Dam is illegally located within Olympic National Park, and that the age of the Elwha Dam creates a long term safey concern demonstrates that the removal of the dams is ethically correct. In fact removal of the dams will ensure greater long range economic viability

I-119: Your position favoring dam removal is noted.

I-120: Comment noted.

I-121: Comment noted.

STAFF REPORT

I-121 cont'd

for Port Angeles and the surrounding area because of the recreational and fishing benefits gained in restoring the Elwha River watershed and ecosystem.

The time is long past to right the wrongs of the past. It is time to take action that will benefit all the public, and not just continue to benefit a special few at the expense of the many.

Respectfully.

J.C. May
132 N.E. 56th
Seattle, Washington
98105 Phone: 524-8123

CC:
Gov. Booth Gardner
Senators Brock Adams and Slade Gorton
Rep. Jim McDermot

Glenn R. Wiggins
702 Caroline
Port Angeles, WA 98362
April 17, 1991

Federal Energy Regulatory Commission
Office of Hydro Power and Licensing
Attn: Ronald McKitrick
825 North Capitol Street N.E.
Washington, D.C. 20426

RE: Elwha River Dams

Gentlemen:

I-122 The threat of removing these dams seems to gain momentum everyday, and frankly, I'm concerned that such an idea could actually become a reality.

I-123 There are a good number of reasons why such an action is ill-advised. The obvious economic reason; ie, the dependent pulp mills, foundation of the North Olympic economy, is apparent. Why this hasn't received more credence is difficult to understand. However the mood of the country seems bent on environmental escapades such as this one, particularly in areas where the political strength of the inhabitants is weak. Consider a loud outcry from Port Angeles citizens against the well-financed and skillfully organized national environmental lobby. The outcome of such a confrontation is predictable.

I-124 This area cannot endure many more economic set backs. Removing the Elwha dams is a gamble that should never be taken particularly in advance of attempts at other fish enhancement ideas. Dam removal, alone, does not assure return of the salmon runs. Many damless streams here, which historically produced great numbers of fish, suffer similar low yields. It's obvious that overfishing, including netting at the river mouths, has decimated the population. Until these streams are producing fish, why would anyone recommend removal of dams that are absolutely vital to the area's economy?

I-122: Your position opposing dam removal is noted.

I-123: Comment noted.

I-124: Comment noted.

COMMENTS OF INDIVIDUALS

I-125 A leader in this campaign to return a wild Elwha to the Olympics is none other than our own National Park Service, which at public expense, funded a study to promote the idea. The inviolate nature of this Park may be important, but no more so than the very serious concerns its actions may have on its neighbors, something which I've noticed, is not high on the Park's priority list.

I-126 It's time to be sensible. These dams have been in place for 70 years. Why must we hurriedly remove them? A rational reason for doing so escapes me.

Apparently the environmental impact statement is in a draft stage. The alternative which maintains the status quo should receive the highest degree of investigation, covering all aspects of the value of these facilities and the potential risks which will result from their removal.

Your charge, as I understand it, is to either issue a license to maintain the dams or disapprove and recommend their removal. I sincerely believe you will take into account the serious long term consequences of the later. Thank you.

Very truly yours,

Glenn R. Wiggins

RESPONSES TO INDIVIDUALS

I-125: Comment noted.

I-126: Comment noted.

Davida Wolf
106 East First Street
Port Angeles, Washington 98362
206-457-6631

April 24, 1991

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street N.E.
Washington, DC 20426

Dear Ms. Cashell:

I-127 I support the restoration of the Elwah's anadromous fish runs. I have examined the issue in depth and have found no reason not to remove both the Glines Canyon and the Elwah Hydroelectric Projects (FERC 588 & 2683).

Please deny licenses for both dams.

Sincerely,

Davida Wolf

Davida Wolf

I-127: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

Federal Energy Regulatory Commission
Attn: Lois D. Cashell
825 North Capitol St N.E.
Washington, D.C. 20426

22 April 1991

Re: Projects Nos. 588 and 2683

Dear Ms. Cashell,

I-128 I am a professional aquatic ecologist. It is my professional opinion that both the Glines Canyon (proj. #588) and the Elwha (proj. #2683) dams should be removed and James River II, Inc. denied its permit requests based on the following considerations outlined in the Federal Energy Regulatory Commissions (FERC) Draft Environmental Impact on these projects.

I-129 It is clear that these projects do not provide a significant amount of the region's electrical energy requirements, only 27.9 megawatts. Furthermore, the public derives absolutely no benefits from this hydroelectric power as all the power is delivered to the pulp and paper mill owned by Daishowa America in Port Angeles. According to the Northwest Power Planning Council's own projected future energy demands, removal of these sources would not result in any energy deficits. In fact, the most probable future energy growth scenarios (the medium high and medium low projections) indicate that renewable energy forms and conservation can provide all future energy needs for the region. Hence removal of these dams does not present an energy problem for the area now or in the next twenty years.

I-130 Much of the Glines Canyon reservoir and the transmission lines are on Olympic National Park Lands. Removal of the dam would restore lost lowland habitat, cross valley elk migration routes and important habitat to associated fish and wildlife consistent with the ecological restoration directive of the National Park Service.

RESPONSES TO INDIVIDUALS

I-128: Your position favoring dam removal is noted.

I-129: Staff disagrees with your statements that the public derives no benefits from the project power and that removal of the dams would not present an energy problem for the area for twenty years. In an interconnected power system, each cost-effective contribution of energy to the system benefits everyone on the system to a small degree. The Northwest Power Planning Council's medium-high and medium-low scenarios indicate that the region will need new resources sometime between 1991 and 1999 (see Section 1.4.3.1). Therefore, any subtractions from the system must be made up for elsewhere by building new projects or through conservation.

I-130: Comment noted.

I-131 Removal of these dams may result in temporary water quality impacts from the release of trapped sediment, but long-term benefits including restoration of anadromous fish runs, riverine habitat, cultural and economic benefits far surpass these short-term adverse environmental impacts. In addition, restoration of anadromous fish runs promotes achievement of the Washington Department of Fisheries management objectives to preserve native genetic diversity. The Lower Elwha Klallam Indian Tribe would also benefit from the restoration of historic steelhead and salmon fisheries which have been decimated by the dams and other factors. Biological diversity will also benefit in the long-term from increased populations of anadromous fish

I-132 Restoration of fish and wildlife habitat, biological diversity and ecosystem functions by removing both dams is consistent with the legal mandates of state and federal natural resource management agencies and FERC's own directive to provide for the public interests in accordance with the Federal Power Act as amended.

Thank you for the opportunity to comment on this draft environmental impact statement.

Sincerely,

Scott Luchessa

Scott Luchessa

I-131: Comment noted.

I-132: Comment noted.

COMMENTS OF INDIVIDUALS

Tom Shindler
499 Little River Road
Port Angeles, WA 98362
(206) 457-5667

4/23/91

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street NE
Washington, DC 20426

Dear Lois,

These comments are in reference to Projects #588 and 2683.

I-133 I would like to support the "Removal of Both Dams Alternative". Even as outlined in the DEIS, it is the preferable alternative.

I would like to see consideration of several additional possibilities:

1. The removal scenario envisioned will be a rather traumatic event to the river's geological and biological systems, delaying fish restoration until several years after it is completed, and requiring significant modification of the river valley during removal. I would like to see an alternative evaluated that would involve making the process gradual enough that natural processes could dominate, and fish restoration could be initiated immediately (using manually assisted means to pass the dams during the process, such as trucks, tunnels, temporary fish ladders, etc.) I see this as occurring over a period up to 20 years.

It seems the entire hope for restoration of wild runs hinges delicately on the survival of the population now spawning in the lower river. Whatever is done must not jeopardize their survival. It seems a gradual process would minimize the potential damage.

In the long run, the geomorphic result will show the process for centuries. Consequently, the more natural processes are allowed to dominate, the more natural will be the result.

I-134 The esthetic impact of a rapid removal will be significant. In an otherwise beautiful National Park setting, this is a significant factor. A gradual drawdown would result in a much smaller disturbed area visible at one time. Natural and/or assisted revegetation would, in a period of several years, begin to reclaim successive rings of the old lake bed.

A very gradual process, which allowed for natural floods, would result in movement of suspended sediment in a style, and at times that would not impact fish as much as the rapid removal alternative. It would be washed out of the lake sediments during floods, not during summer low flow. This would be a significant factor in favor of survival of existing fish in the lower river, and of restored fish.

Concern was expressed about hazards to water quality during the removal. A more gradual process could minimize those hazards, extending the time period for long term solutions to natural sedimentation as well.

If a gradual process were used, power could continue to be generated at gradually decreasing rates for a few years, possibly easing that transition as well.

I-135 2. For disposal of dam pieces, why not truck them to Ediz hook, where they can do some good, and replace sediment that they prevented from arriving from the River? It seems fair as well as efficient.

I-136 3. Whatever process is eventually selected, once removal is even tentatively approved, a gradual drawdown of Lake Mills should be begun immediately, with immediate reseeding or replanting. Even if the removal process is revised, or even revoked, there would be no options precluded by such a course of action.

Thank you for considering my views,

Tom Shindler

RESPONSES TO INDIVIDUALS

I-133: Your position favoring dam removal is noted.

I-134: Gradual removal would require fish passage facilities on the scale of those analyzed for the applicant's proposal in addition to the costs for dam removal, which would be greater because of the extended work schedule. In the FEIS, the removal alternatives have been shortened to a 3-year program with the greatest impacts in a 2-year period to reduce the number of fish generations that would be impacted.

I-135: For the cost estimates of removal alternatives, it was assumed dam rubble would be trucked to an upland site for disposal. Some of the material would be usable for resale but salvage value would depend on market conditions, which are constantly changing.

I-136: Comment noted.

COMMENTS OF INDIVIDUALS

F.E.R.C.
Office of Hydro Power & Licensing
825 N.Capitol St. NE
Washington,D.C. 20426
Attn:Ronald McKitrick

Dear Mr. McKitrick;

I-137 I am writing this in support of REMOVAL of the Elwha dams on the Olympic Peninsula of Washington state.I am a Port Angeles landowner and I follow the dam debate carefully in the Peninsula Daily News.

I-138 The only arguments against dam removal seem to be (a)the Daishowa mill will have less capital for "possible" future expansion because of higher power rates, and (b) there could be some commercial water quality degradation (this is always vaguely put).

My rebuttal to (a) is this:the present 320 jobs at the mill are not in jeopardy by anyone's claim.Only the vague possibility of mill expansion might be affected.Balanced against a certain expansion in sports and commercial fishing and the resultant environmentaly clean tourism industry, the idea of a "possible" expansion of a dirty industry (smell the mill!) taking precedent is truely ludicrous!! This choice seems so blatently in favor of dam removal that the lonely support of the city of P.A. and the County Commissioners makes one wonder just what else is being brought to bear on these elected officials ?

The rebuttal to (b) is that rather inexpensive water purification technology is available and used by most major industries today with no complaints.Industrial water problems usually revolve around water volume not quality but as I am not knowledgeable about this case, I cannot comment.

I-139 I believe that with the tremendous nationnal interest in the degradation of the Colombia and Snake river salmon runs, and the fishery in general,the removal of these dams will get national acclaim and support.Here is the potential of renewing the fishery of an entire river combined with the restoration of a National Park's integrity all at the micro cost of "possible" mill expansion. These two dams have long since been depreciated fully and have outlived their time.Even the cost could surely be recovered if the F.E.R.C. would just ask the environmental groups to mount a national funds campaign.I am sure they would put 'their money where their mouths are'.

I-140 I suggest your agency stop trying to please everyone (impossible!),go with a clear local,state,and national majority,and do the logical thing.Wasting money and time on studies, delays, and extensions only prolongs the agony although I recognize the need to have a process to make everyone feel considered.I believe the time for restoration of this resource is at hand- I trust you will agree.

Sincerely,

O.Dale Collins

O.Dale Collins 111,M.D.,Ph.D
4925 Longview Way
El Cajon,Cal.,92020

RESPONSES TO INDIVIDUALS

I-137: Your position favoring dam removal is noted.

I-138: Comment noted. Staff wishes to point out that: a) the cost of power to Daishowa Mill would go up under the dam removal alternative (and all other alternatives) regardless of whether the mill expands (Section 2.7.3); sport and commercial fishing for several species would be reduced for 8 to 10 years or more under all alternatives, because restoration of fish runs also requires harvest restrictions (Sections 4.1.8.2, 4.2.8.2, 4.3.8.2, and 4.4.8.2); and c) the quality of water is an important factor for several of Port Angeles' industries, and the cost of maintaining the quality of the water supply would not be small under the dam removal alternative (Sections 4.2.2.2, 4.2.2.3, and Appendix A).

I-139: Comment noted.

I-140: Comment noted.

January 07, 1991

John Tolan
25213 143Rd St SE
Monroe, Wa. 98272

F.E.R.C.,
825 Capitol St. N.E.,
Washington D.C. 20426

"Elwha (FERC #2683) and Glines (FERC #588) Hydroelectric Projects, Operation and Maintenance, License, Elwha River, Washington State."

Dear F.E.R.C.,

I-141 I am writing this letter to pledge my support for the removal of the Glines Canyon and Elwha dams located on the Elwha river in Washington State. I am a native of Washington State and routinely visit the Olympic National Park on weekend excursions. Over the years I have seen numerous roads that had extended into the National Parks boundaries closed. The reason that these roads have been closed is to preserve this beautiful piece of nature that we in this nation are so lucky to have. I for one will throw my support behind any movement to restore and enhance a piece of this beautiful National Park.

Sincerely,

John J. Tolan

John J. Tolan

I-141: Your support for dam removal is noted.

April 26, 1991

S. Ronald McKitrick
Federal Energy Regulatory Commission
825 Capitol Street NE
Washington D.C. 20426

Dear Mr. McKitrick:

I-142 I wish to go on record as opposed to the removal of the Lower Elwha and Glines Canyon Dams. Among the many reasons that have already been stated by others include:

I-143 The existing dams and reservoirs have recreational and aesthetic values that are more significant to me that the comparable reach of "free flowing stream". I like streams but I also like lakes. Removal of the dams results in streams only and takes away the lakes.

I-144 The dams provide an independent source of power that would be vital to our community in the event of a disaster or other loss of power from Bonneville Power Administration.

I-145 I believe the cost of proper removal and the adverse impact on the City of Port Angeles water supply are more significant than reported in the Draft Environmental Impact Statement.

Sincerely,

J. R. Jerry Newlin

J. R. Jerry Newlin
716 Strait View Drive
Port Angeles, Washington 98362

I-142: Your opposition to dam removal is noted.

I-143: Comment noted.

I-144: Comment noted.

I-145: The cost analysis in the FEIS (Section 2.7.3 and Appendix A) includes a re
estimate of the costs of dam removal.

COMMENTS OF INDIVIDUALS

June 27, 1991

FERC
Department of Hydro Power and Licensing
Washington, D.C.
ATTN: Ron McKitrick

Gentlepeople: RE: ELWAH RIVER DAMS

I-146

This is simply to go on record in support of the removal of both the Lower Elwah Dam and the Glines Canyon Dam.

This would provide an additional 40 miles of spawning territory for Chinook salmon, which were once in abundance on the Elwah River. At a time when depletion and wanton distruction of our natural resourses prevails throughout the world, it is imperitave that we take advantage of this rare and wonderful opportunity to reverse the damage. We must begin to restore the ancient salmon runs to this river's upper stretches.

I join with the Department of the Interior, the National Park Service, Fish and Wildlife Service, the Bureau of Indian Affairs, The U.S. Forest Service, the Northwest Indian Fisheries Commission, the North Pacific International Chapter of the American Fisheries Society, and countless environmental and conservation groups in urging you to terminate the licenses for these two dams, and subsequently remove them with all due speed.

Sincerely,

C. A. Glock-Jackson

Cheryl Ann Glock-Jackson
8450 Southeast Willock Road
Olalla, Washington 98359

RESPONSES TO INDIVIDUALS

I-146: Your support for dam removal is noted.

COMMENTS OF INDIVIDUALS

Leland Smith
7410 29th St. NW
Gig Harbor, WA 98335

June 21, 1991

Federal Energy Regulatory Commission
Office of Hydro Power and Licensing
Attention: Ronald McKitrick
825 N. Capitol St. NE
Washington, D.C. 20426

To the members of the Commission:

I-147 Please accept my commentary as one who is in favor of removal of the two hydroelectric dams on the Elwha River (Clallam County and Olympic National Park, Washington).

I am a native of Port Angeles and a current resident of Gig Harbor, Washington.

The chance to restore the Elwha and its watershed to its' natural state is an opportunity to reclaim a landmark that's potentially greater than the Space Needle. I believe removal of the dams is in the best interest of the residents of Clallam County, Washington State, and the United States for the following reasons:

I-148 1) The chance to witness a river system — as well as runs of five different Pacific salmon species — repair naturally would be fascinating. It would also provide data for environmental science that would be unequaled for decades.

I-149 2) The sport fishing opportunity created by the restoration of these salmon runs would ensure an industry (fishing and tourism) that would be the greatest benefit for all in the long-term; locally and state-wide.

I-150 3) Selfishly, I have been hiking on the upper Elwha for 20 years. It is an area of impeccable value. You can always build more mills, but you can never build another watershed like the upper Elwha. In restoring the Elwha, we have a chance to create something that can — in theory — last forever. A chance like that doesn't come along every day, does it?

I-151 4) From what I understand, wasn't the Lower Elwha Dam built unlawfully in the first place?

It is my hope that the Commission will do the right thing and terminate the licenses for these two dams. It is my hope the Department of Interior will remove the structures. It is my dream that nature will heal over from these blockages and my children will one day see salmon spawning in the Press Valley.

Sincerely yours,

Leland Smith

RESPONSES TO INDIVIDUALS

I-147: Your position in favor of dam removal is noted.

I-148: Comment noted.

I-149: Comment noted.

I-150: Comment noted.

I-151: When the Elwha dam was constructed, it was not under Federal Power Commission jurisdiction.

DRAFT
STAFF REPORT

ANN LENNARTZ
603 37TH AVENUE
SEATTLE, WASHINGTON 98122

May 30, 1991

Federal Energy Regulatory Commission
825 Capitol St. N.E.
Washington, D.C. 20426

RE: Elwha (FERC #2683) and Glines (FERC #588) Hydroelectric Projects, Operation and Maintenance, Licence, Elwha River, Washington State

I-152

I STRONGLY SUPPORT REMOVAL OF THE GLINES CANYON DAM AND ELWHA DAM ON THE ELWHA RIVER.

Dams on Pacific Northwest rivers are decimating wild salmon runs. Removal of dams on the Elwha river would allow one of the NW wild salmon runs to recover.

Fish farming is not yet a proven economic alternative to harvesting wild fish runs. Fish farms pollute, possibly harming other fisheries, and require high use of antibiotics to prevent disease. Use of antibiotics in other farming activities has shown that, over time, increasing amounts must be used to remain effective, and that often, developed immunities require use of new, more powerful, potentially harmful antibiotics which again must be used in increasing amounts. Many fish farms on the West Coast are not profitable.

Harvesting wild fish runs remains the most economic, least polluting alternative. Also, wild fish runs are important sources of genetic diversity, for use in breeding programs. Thus, it remains in our state's and nation's best interest, economically, to preserve and enhance its wild fish runs.

PLEASE, REMOVE THE GLINES CANYON DAM AND ELWHA DAM ON THE ELWHA RIVER.

Respectfully Submitted,

Ann Lennartz

Ann Lennartz

I-152: Your position favoring dam removal is noted.

June 3, 1991

F.E.R.C.
825 Capital Street N.E.
Washington D.C. 20426

SUBJECT: ELWHA (FERC #2683) and GLINES (FERC #588) STATEMENT AGAINST REMOVAL OF THE ELWHA AND GLINES CANYON DAMS

Dear Sirs;

I-153

This letter is to register my objections to the removal of the Elwha and Glines Canyon Dams on the Elwha River, Clallam County, Washington State.

The dams have been in place for more than 50 years, resulting in the existing ecosystem that would be destroyed by the dams' removal, the loss of Lakes Aldwell and Mills and the ensuing silt flow.

I-154

The "Giant Elwha Salmon" cannot be restored as environmentalists believe and neither can the dinosaur. However, we can and must protect the remaining wild salmon as well as the other flora and fauna dependent on the lakes and the river.

There are many facets to this highly emotional environmental problem, therefore, further objective evaluating must be done before a decision is reached. The question is not "Are the native salmon in danger?", rather, "How can the endangered salmon be helped?" They can be helped by;

1. Installation of Eicker Fish Screens at both dams to allow safe passage of juvenile salmon down stream.

2. Installation of fish ladders around the lower dam and "trap-and-truck" to move mature salmon around the upper dam.

3. Limit or eliminate netting of fish on all the rivers. The netting that is being done now is appalling and must be seen to be believed!

4. Regulate or eliminate drift net fishing on the open ocean and enforce the 200 mile boundary.

5. Study the impact of commercial, sport and native fishing on the salmon runs and regulate accordingly.

6. Study the impact of seals and sea lions on the fish runs.

The above must be addressed since there is no point in removing the dams for fish that never reach them.

I-153: Your position opposing dam removal is noted.

I-154: Many of your proposals for helping fish stocks have been included in the projects and recommendations (see Sections 2.2 and 4.1.3.3). Some are beyond the scope of the EIS (e.g., seal impacts, netting regulations, and high seas drift netting). While all of these factors influence fish, their analysis will not substantially influence the measure of impacts of the considered alternatives and the decision to license the projects. Some have been indirectly discussed (e.g., inriver harvest) in the analysis of effects of harvest on the stocks potential for restoration and possible outcomes of the activity on different fisheries (see Sections 4.1.8 and 4.2.8).

DRAFT
STAFF REPORT

COMMENTS OF INDIVIDUALS		RESPONSES TO INDIVIDUALS	
I-155	Also to be considered is the potential loss of electrical power generation if the dams are removed. Western Washington is heading rapidly for an overload of the present electrical cross Cascades transmission system. Local power generation must be encouraged, not eliminated.	I-155:	Comment noted.
I-156	The citizens of the Olympic Peninsula need time to resolve the "Spotted Owl issue" which has recently negatively impacted the logging industry with loss of jobs, wood products and revenue. We cannot afford the "costs" of the dam removals.	I-156:	Comment noted.
I-157	The Olympic National Park argues that the park should be returned to its pristine condition. Beside the fact that the dams were installed before the Park boundaries were set, there are within the Park, Hurricane Ridge Lodge, Kalaloch Lodge, Lake Crescent Lodge, and Solduck Hot Springs Lodge, all of which are far from pristine. The beautiful Lakes Mills and Aldwell are used and enjoyed by the park patrons.	I-157:	Comment noted.
I-158	My husband and I are avid outdoors people and have lived on the Olympic Peninsula almost 25 years-we care deeply about our cherished environment and want to share it with future generations. The choices made now are critical- let's make the correct ones, not ones that will compound existing problems. Please see the enclosed clipping from the Sequim Gazette. In his 90+ years, Mr. Haller has seen first hand the depletion of our salmon and steelhead in ALL of our rivers - the existence of the dams is not the only deterrent to the fish survival. Let's leave the dams in <u>and</u> protect the wild fish runs.	I-158:	Comment noted.

Very Truly Yours,

Gail McLain

Gail McLain
211 Spath Road
Sequim, Washingtion
98382

Dear MS. Cashell,
P-588
2683

Thank you for

I-159 Your efforts aimed at removing the Elwah dams, upper and lower. The decision is correct, economics and ecology both considered. Please investigate the pros and cons of removing other dams. The issue is complex and difficult, but important.

Sincerely, Joe Eisenschmidt

I-159: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

JANET THOMPSON
[illegible] N.E
SEATTLE, WA. 98125

Mr. [illegible] Ronald McKitrick
Federal Energy Regulatory Commission
825 North Capitol Street N.E.
Washington D.C. 20426

June 27 1991

Dear Sir:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the Glines Canyon (FERC No. 588) and Elwha (FERC No. 2683) Hydroelectric Projects. The extension of the comment period is also highly appreciated.

I-160 I strongly support and urge the removal of both the Glines Canyon and Elwha Hydroelectric Projects from the Elwha River. The proponent's alternative will not satisfactorily meet objectives identified in the scoping process. Specifically, the restoration of wild, self-sustaining runs of anadromous fish and the restoration of natural conditions within the Olympic National Park will not be accomplished.

I-161 The proponent's proposed mitigation, installation of both upstream and downstream fish passage facilities and other measures presents significant problems in establishing wild salmon runs in the long term. We need to utilize the experience and knowledge gained from the Columbia Basin. Mitigation in that system has not resulted in maintaining wild salmon runs but instead has lead to their demise. Likewise, over the long term, the costs involved in the proponent's mitigation measures will result in viable wild runs of salmon. Additionally, the incomplete restoration of all five of the original salmon runs identified in the EIS should not be ignored. It is not an acceptable tradeoff when complete restoration of all five runs is within the realm of possibility.

I-162 The removal of the dams affords the public the best opportunity to see if wild salmon runs, with the accompanying increase in wildlife diversity, can be reestablished. This is very important to the health of the watershed and to Olympic National Park. There should not be a dam within the boundaries of a national park. It is especially egregious to have a dam in a national park that identified as a world biosphere reserve and a World Heritage park by UNESCO. The scenic and ecological resources of the Elwha Watershed need to be restored and nature allowed to once again manage the resource.

Again I would like to strongly urge that both the Glines Canyon Dam and the Elwha Dams be removed.

Sincerely,
Janet A Thompson
Janet A. Thompson

RESPONSES TO INDIVIDUALS

I-160: Your position favoring dam removal is noted.

I-161: Comment noted.

I-162: Comment noted. Staff notes, however, that the dams were in place before the a was designated a national park.

Lois Cashell
Secretary
FERC
825 North Capitol St, NE
Washington, DC 20426

7/9/91

Dear Lois,

I-163 I am writing regarding FERC's recent review of the Glines Canyon and Elwha Dam's on the Olympic Peninsula. Your agency seems to have been negligent in the DEIS by dismissing the efficiency plan for the Daishowa Mill devised by conservation groups opposed to the dam.

I believe the relicensing of these dams is both economically and ecologically a mistake. As I mentioned earlier, it is possible for the mill to implement energy conservation measures which would make the dams obsolete. Ecologically, these dams are a disaster to the already endangered salmon species that used the Elwha River for their spawning grounds. A restored fishery would provide income for native americans and would bring in tourists to fish for the salmon.

I-164 I encourage your agency to not allow these dams to go on line They provide a very minimal (if at all) benefit to the people of the area. Destroying the dams would allow a once productive salmon fishery to return.

Sincerely,
Peter M. Kiffney Peter M. Kiffney
235 N. Grant St
Ft. Collins, CO
80523

I-163: The staff's evaluation of conservation potential at the Daishowa America Mill relied on all authoritative sources, particularly the 1991 energy audit conducted under the sponsorship of the Bonneville Power Administration (Section 2.7.3). Furthermore, any viable conservation measures could be undertaken regardless of whether the dams are removed; it would be most economically beneficial to use conservation to replace higher cost purchased power than to replace the lower cost power produced by the Elwha and Glines Canyon projects.

I-164: Your position favoring dam removal is noted.

Bryan L. Wyberg
5604 Morgan Ave. S.
Minneapolis, MN 55419

July 8, 1991

Secretary Louis Cashell
Federal Energy Regulatory Commission
825 North Capitol Street
Waashington, DC 20426

Dear Secretary Cashell,

I-165 I am writing to you today to express my concerns about the Draft Environmental Impact Statement prepared by the Federal Energy Regulatory Commission in consideration of the relicensing of the Glines Canyon Dam and the Elwha Dam. From the information which I have read, I believe that the interests of the public would be best served by the removal of these two dams.

I-166 The restoration of the salmon runs currently blocked by these dams will result in a greater commercial benefit to the region than the electricity being supplied by the dams. The power being supplied by the dams could easily be replaced by another source. I have also read that the Daishowa pulp mill could eliminate its need for the power supplied by the dams by implementing conservation measures already known about. I also do not believe that a hydroelectric dam should be located within the boundaries of a National Park.

I-167 I believe that the FERC has distorted its report by ignoring the benefits to the commercial fishing industry from the salmon run restoration. I feel that the facts indicate that there will be greater benefits resulting from the removal of these two dams. I therefore request that the relicensing of these two dams be denied by the FERC.

Sincerely,

Bryan Wyberg

I-165: Your position favoring dam removal is noted.

I-166: Comment noted.

I-167: The long term economic benefits to commercial fishing are discussed in the EIS in the sections on long-term socioeconomic impacts of each alternative (Sections 4.1.8.2, 4.2.8.2, 4.3.8.2, and 4.4.8.2). Note, however, that full recovery of wild salmon runs would require at least temporary, and sometimes permanent, reductions in the harvest rate of some species.

7-11-91

Dear Lois Cashell

I-168 I do not believe you should be in favor of relicencing Glines and Elwha Dams. the benifits of restoring trout and salmon runs outwiegh the cost of finding new Power. I understand that the Pulp and paper Mills owned by Daishowa have been presented with an efficency plan that would save at least as much power as the dams Provide.

I strongly believe that the Klallam tribe and the local residents needs must come before a Japanese paper mill.

[signature]

I-168: Your position favoring dam removal is noted. See also response I-163.

I-169

A reply is requested

Howdy,

I am writing in support of modifying your report (DEIS) regarding the relicensing of the Elwha and Glines Canyon Dams adjacent to and in Olympic N.P. Don't bow down to the greed heads (Daishowa) select as a preferred alternative the removal of both dams

Thanks!
Rick Jones

Our descendants and the trout and salmon will thank you!

I-169: Your position favoring dam removal is noted.

I-170

Lois Cashell
Secretary
FER Commission
825 N. Capitol St., NE
Washington, DC 20426

7/20/91

Sun Valley
Sun Valley Company
Sun Valley, Idaho 83353

John Pluntze
Sun Valley Co.
PO Box 2711
Sun Valley, ID 83353

OFFICE OF THE SECRETARY
91 JUL 23 AM 9: 11
FEDERAL ENERGY REGULATORY COMMISSION

Dear Miss Cashell:

I strongly urge you and your commission to NOT relicense Glines Canyon Dam and Elwha Dam. As a transplanted Washingtonian (I was born in Olympia), I am adamantly opposed to the dams because they have been and continue to be a major threat to trout and salmon runs through Olympic National Park. Fish that once swam from the Pacific 75 miles up the river to spawn are halted 5 miles inland. I realize all too well that the dams supply energy to a paper mill (owned by Daishowa) but I also know — though perhaps the FERC wishes I didn't know — that the mill has been presented with a very sound and reasonable energy <u>conservation</u> plan that, if implemented, would surely save as much or more power as the dams provide! That's a plan worth implementing — now!

Your Commission has also been woefully ignorant in not calculating the potentially immense monetary gains (i.e. sports fishing tourism, commercial fishing) to be made by restoring these runs. And your assertion that the dams would have to be <u>removed</u> (admitedly a high cost) in order to re-establish such runs is decidedly wrong-headed. Architectural alterations to the dams could encourage runs without necessitating their entire removal.

Please rethink your current strategy instead of sacrificing more of the pristine Pacific Northwest to conglomerate greed.

Sincerely,

John Pluntze

I-170: Your position is noted. See also responses I-163 and I-167.

COMMENTS OF INDIVIDUALS

JAMES L. DENISON
6931 11TH STREET
LONG BEACH, CAL.
90815

July 8, 1991

Dear Ms. Cashell,

I-171 We are among the millions of Americans who want to enjoy seeing wilderness and wildlife instead of dams + paper + pulp mills! On a recent visit to the Pacific Northwest we were appalled at the destruction of the beautiful forests, etc. FERC has slanted the evidence toward retaining the dams that block trout + salmon runs through Olympic Nat'l Park. Please help us save our natural heritage!

Sincerely
Mr. + Mrs. J. Denison

RESPONSES TO INDIVIDUALS

I-171: Your position favoring dam removal is noted.

COMMENTS OF INDIVIDUALS

I-172

As a member of the Port Angeles Board of REALTORS, I am opposed to the removal of the Lower Elwha and Glines Canyon dams for the following reasons:

FILED
OFFICE OF THE SECRETARY

Removal of the dams would result in:

1. Destruction of long-established habitat for migratory water fowl, rare birds of prey (including the spotted owl), beaver, heron, otter and anadromous fish.
2. Destruction of designated wetlands.
3. Destruction of two pristine uninhabited recreational lakes.
4. Unknown repercussions on the Port Angeles domestic and industrial water and hydro-electric supplies. Why jeopardize domestic water and hydroelectric supplies when other areas of the Pacific Rim are suffering water and power shortages!
5. Unknown flooding impacts on private properties throughout the Elwha basin.
6. A negative economic impact on the Port Angeles community in the areas of fisheries, employment and tourism.
7. Poor stewardship of public money and trust. Restoration of the salmon runs can be accomplished without creating the unpredictable economic and environmental consequences of dam removal. According to some authorities, there is a direct correlation between the decline in the salmon fishery state-wide and the 1972 Judge Bolt decision. For example, the Dungeness River has experienced a fishery decline similar to the Elwha and the Dungeness has no dams! As long as native Americans continue unrestricted netting at the mouths of all major rivers, the Department of Fisheries can only speculate on any restorative measures with or without dams. The sad fact is that the only study (by Milton Griffing using FERC EIS numbers) correlating dam removal costs versus increased fish production, shows that the actual annual cost of producing $1 worth of fish will be $31 out of someone's pocket.
8. Problems in regard to sediment removal including filtration of Port Angeles, Dry Creek and other domestic water supplies, sediment disposal and destruction of existing fishery due to high sediment levels during dam removal and an extended period thereafter.
9. Loss of recreational use of Elwha Basin for a number of years including loss of access to Olympic Hot Springs, Boulder Lake, Appleton Pass and all points reached from Whiskey Bend.
10. Damage to the Aesthetic quality of the park for decades to come.

I-173 It will continue to be our concern that the FERC EIS made no economic projections for the fisheries loss during dam removal or artificially supporting the existing salmon runs during dam removal.

I-174 By FERC's own admission, the socioeconomic impact was not a primary objective of their EIS and consequently the impact on the surrounding community has been inadequately addressed. The focus of the EIS was on saving fish, at any cost. We feel people are more important than fish.

I-175 We are gravely concerned about the FERC's continued reluctance to convert dam removal impact to dollars and cents in a format meaningful to the taxpayer/voter.

I-176 Since it is patently absurd to think James River will pay for the removal, it is imperative that we get realistic about who indeed is going to pay. That question needs to be addressed up front!

Jeanette D. Sturm
465A Olympic Hot Springs Rd
Pt. Angeles, WA 98362

RESPONSES TO INDIVIDUALS

I-172: Your reasons for opposing dam removal are noted.

I-173: See response I-106.

I-174: Comment noted.

I-175: See response I-108.

I-176: See response I-108.

COMMENTS OF INDIVIDUALS

1330 EDEN VALLEY ROAD
PORT ANGELES, WA 98362
MAY 15, 1991

FILE SECRETARY 1113:07 ...SION

Dear Mr. Shumway,

I-177 After reading the DEIS I'm still of the opinion that both dams should be removed and efforts to re-establish the fish runs started.

I-178 The mill has been employing fewer and fewer people over the years and with the newer technologies being employed (and projected for the near future) they'll need fewer employees. There is now a new plant (mill) being built in BC that will be more efficient concerning water and electricity - maybe the local mills could get some pointers on being more efficient. The mill doesn't get all that much electricity from the dam and it could be supplied from other sources (for special rates to make up for having to switch).

I-179 The city water supply shouldn't be all that bothered by turbidity, because it's filtered through the river gravel. New standards are going to have to be met, so they'll be changing their system anyway. They should have more than one source for their water.

RESPONSES TO INDIVIDUALS

I-177: Your position favoring dam removal is noted.

I-178: Comment noted.

I-179: Comment noted.

If the dams come out we shouldn't have to
I-180 rebuild "the spit" all the time; nature will agai
take care of it and that money can be used to
help mitigate the effects of removing the dams.

The Indians should have some sort of flood
protection put in place. The dams have never
done this. The Indians are the losers from the
dams. Their livelihood and way of life were
I-181 ruined when the dams went in. When the runs are
reestablished they should benefit from them. This
was their land and they never gave it up. Some
way to renew their cultural spirit and dignity
has to be returned to these people.

Tourism is the way of our future. We need
I-182 to keep our countryside beautiful and put
the fish back in our waters. We need to be a
destination spot. Taking the dams out is
a good start.

Yours truly,

Ruby L. Keller (Mrs)
RUBY L. KELLER

I-180: The EIS indicates that it would take 10 to 20 years for additional sediment from the Elwha River to begin depositing on Ediz Hook (Section 4.2.1.2). This deposition would gradually reduce, but would not eliminate, the need for the current beach replenishment program (Section 4.2.8.2).

I-181: Comment noted.

I-182: Comment noted.

Lois D. Cashell, Secretary
F.E.R.C.
825 North Capitol St. N.E.
Washington, D.C. 20426

April 29, 1991

Robert and Sherilyn Wells
1020 Geneva
Bellingham, Wa. 98226

Dear Ms. Cashell/F.E.R.C.,

I-183 We encourage you to take down the ELWHA dams. Serving on the Puget Power Least Cost Planning Panel for Whatcom County has made Mrs. Wells aware of the tremendous potential that conservation and efficiency have to reduce demand. We refer you to the COMPETITEK program of Rocky Mountain Institute (Amory Lovins) and Syscom, a company specializing in retrofitting for energy savings. Cogeneration potential might also be explored. Rocky Mountain Institute writes of a pilot solar project on the Olympic Peninsula utilizing diffuse light. This may also be applicable to Daishowa's needs and should be investigated.

I-184 The salmon's importance to the Northwest is both symbolic and literal. Cultures and ecosystems have been carefully built around this amazing fish and, in its eleventh hour, it deserves our every effort to restore its habitat and population. The EPA Science Advisory Board's report Reducing Risk lists loss of habitat, loss of biological diversity, and species extinction among the most threatening problems we now face. With our incomplete understanding of how our future is entwined with the survival of other species, we would do well to be less cavalier and more concerned with preservation.

I-185 The Elwha dam was built illegally and never licensed federally. The Glines dam is within Olympic National Park boundaries, in violation of federal law. Their maintenance costs are rising rapidly as they age, making the cost of electricity concurrently more expensive and causing BPA's costs to become competitive as a potential supplier.

Empty streams and disappearing wildlife are too high a price to pay for a problem that has alternative solutions. Let us be wise and remember the importance of nurturing our interconnectedness with all life. PLEASE bring down the dams!

Thank you.

Sincerely,

R.R. Wells
Sherilyn Wells

I-183: Staff believes that the EIS adequately addresses the regional power supply alternatives (Sections 2.6 and 2.7). See also response I-163.

I-184: Comment noted.

I-185: Comment noted. The Glines Canyon dam was in place prior to designation of the Olympic National Park, and staff is not aware of any information suggesting that the dam's presence in the park is, per se, illegal.

COMMENTS OF INDIVIDUALS

4-25-91
6670 Cape George Road (1250 Dan Kelly Rd.) 1-206-385-6670
Port Townsend, Wa 98368 (Port Angeles, Wa. 98362)

Federal Energy Regulatory Commission
Office of Hydro Power and Licensing
Attn: Ronald McKitrick
825 N Capitol St. N. E.
Washington D. C. 20426

Dear Mr. McKitrick:

I-186 I live one mile from the Lower Elwha Dam. I watch water thunder over that dam in winter, brown and rolly. I watch salmon bump their noses on the dam as they try to swim upstream in the turquoise spring water and the blue summer water. These huge fish sport unique genes which are endangered. Salmon decimation on our coast is well documented. These two dams decimate precious salmon runs, do not have permits and should not be permitted. You have a chance to remove two ugly environmental disasters wrestled into place by insensitive engineers. Please do it.

I-187 Over centuries a few miles east of it's mouth, the Elwha River run-off sands created Ediz Hook in the Straits of Juan de Fuca. This Hook protects the lovely, busy, deep-water Port of Port Angeles. The Port hums with activity year 'round. When I moved to Port Angeles in 1964, Ediz Hook stretched long and pristine to the United States Coast Guard Station on the eastern tip of the Hook. Erosion began when the dams were installed. The Station perched on the long sandy Hook nearly lost the link of sand to the shore. Now, the once clear view to Victoria, B. C. and the horizon's curve to Asia lie unseen behind rip-rap deposited by nervous engineers alerted to the erosion of Ediz Hook. The Elwha sands destined for the Hook lie behind the dams at the bottom of Lake Mills and Lake Aldwell unable to continue naturally to restore Ediz Hook. Slowly and inevitably, this sand is filling the lakes behind the dams. Slowly and inevitably, the Hook is washed away by the tides. Eventually, the lakes will fill with sand, but the salmon and the Hook will be gone. Salmon ladders will not release the Elwha sands.

I-188 Salmon to the stream bed; sand to the spit. Two precious migrations stopped. I will raise my taxes to unstop these migrations. Let us pay for removal, electricity replacement, and a new water system for Port Angeles.

Sever the dams; save the salmon; salvage the Hook. Do it.

Thank you for the opportunity to respond.

Sincerely,

Jim Jackson

RESPONSES TO INDIVIDUALS

I-186: Your position favoring license denial is noted. Your comment that the two dams do not have permits is only partially correct; the Glines Canyon project does have a license, although the Elwha project does not.

I-187: Comment noted. The EIS (Section 3.2.12) points out that the dams are only partially responsible for the erosion of Ediz Hook. The water supply pipeline protective armoring at the base of the sea cliffs is also a factor in Ediz Hook erosion.

I-188: Comment noted.

DRAFT
STAFF REPORT

January 07, 1991

John Tolan
25213 143Rd St SE
Monroe, Wa. 98272

F.E.R.C.,
825 Capitol St. N.E.,
Washington D.C. 20426

"Elwha (FERC #2683) and Glines (FERC #588) Hydroelectric Projects, Operation and Maintenance, License, Elwha River, Washington State."

Dear F.E.R.C.,

I-189 I am writing this letter to pledge my support for the removal of the Glines Canyon and Elwha dams located on the Elwha river in Washington State. I am a native of Washington State and routinely visit the Olympic National Park on weekend excursions. Over the years I have seen numerous roads that had extended into the National Parks boundaries closed. The reason that these roads have been closed is to preserve this beautiful piece of nature that we in this nation are so lucky to have. I for one will throw my support behind any movement to restore and enhance a piece of this beautiful National Park.

Sincerely,

John J. Tolan

John J. Tolan

I-189: Comment noted.

DRAFT STAFF REPORT

COMMENTS OF INDIVIDUALS

June 3, 1991

F.E.R.C.
825 Capitol St. NE
Washington D.C. 20426

RE: Elwha FERC (#2683)
Clines FERC (#588) Hydroelectric Projects
Operations & Maintenance
License, Elwha River, Washington State

Gentlemen:

I-190 Most of us in Port Angeles are definitely against taking out the dams in the area. The devastation alone that would be caused to the environment should be enough reason to leave them in place. Lake Mills is highly used for recreational purposes. If the lake was drained it would certainly not add to the beauty of the area and the impact on the environment would cause many problems.

I-191 It appears that the Olympic National Park does not want the dam. I question the Park's reason for removal of the dam in wanting to turn the area back to its pristine origin. If this is so why do we have the Log Cabin Resort inside the Olympic National Park on Lake Crescent? Why do we have the Sol Duc Hot Spings, the Kaloch Resort, and the Lake Quinalt Lodge, which are all privately run, inside the Park boundaries?

I-192 I enjoy having the Park in my backyard, and frequently use its trails for hiking, and cross country skiing. I would certainly hate to see a big gaping whole where Lake Mills is now. When the old Olympic Hot Springs was razed a big mess was made and the area certainly hasn't improved with age since that time.

I-193 Where the question of fish is concerned I feel that the enclosed article really puts the blame where it should be. The article states that the Dungeness River has no dams and the fish population is declining there also. It seems that the Indians are allowed to do anything they are in a mood to do no matter what the environmental impact is.

I-194 I am a member of the Seattle Mountaineers, however, I do not agree with their wish to remove the dams. It is rare to find anyone in Port Angeles who wants the dams removed. They were built for a purpose before the area was proclaimed a park and they are still being used for that purpose.

Thank you,
Dorothy Phillips
Dorothy Phillips
610 E 4th St.
Port Angeles, WA 98362

RESPONSES TO INDIVIDUALS

I-190: Your opposition to dam removal is noted.

I-191: Comment noted.

I-192: Comment noted.

I-193: Comment noted.

I-194: Comment noted.

Acampo Ca 9522.
July 10, 1991
Bruce D. &
Kola M. Jones

To:
Lois Cashell
Sec. F.E.R.C.
825 N. Capital St N.E.
Washington DC. 20426

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I-195

How can you favor rebuilding dams in the Olympics by distorting the evidence and the opposition of local residents, members of Congress, and the Klallam tribe.

And for what to supply energy to a Japanese paper pulp mill. Costs to whom?? Certainly not the commercial fisheries or sports fishing or tourism. The D.E.I.S. is an unsuitable entity for making decisions. Stop now and do not let the dams be relicensed.

I-195: Your opposition to licensing the projects is noted.

COMMENTS OF INDIVIDUALS

MRS. JOHN B. BLAKE
12213 WILDCAT ROAD
POST OFFICE BOX 85
MYERSVILLE, MARYLAND 21773

July 21

Dear Ms Cashell

I-196 I have read, in National Parks Magazine that the Federal Energy Regulatory Commission is considering relicensing two dams that block trout and salmon runs through Olympic National Park. I hope the Commission will consider the economic benefits of fishing and tourism for the future of that area and other ways for present businesses to take care

RESPONSES TO INDIVIDUALS

I-196: Your opposition to licensing the projects is noted.

I-197

Dear Secretary,

I am writing to you in opposition to the proposed relicensing of two dams in Olympic National Park for operation by FERC. I was very disturbed to hear an efficiency plan presented to the mill that would render operation of the dams obsolete was completely ignored. If anadromous fish cannot find refuge in our national parks, where on earth will they? FERC has not considered the alternatives and is ignoring the consequences: destruction of our precious natural resources. You must reconsider your plans.

Thankyou,

Michele Barnett

Anne Zauner

Jen Zauner

I-197: Your opposition to licensing the projects is noted. Refer also to response I-163.

COMMENTS OF INDIVIDUALS

PAUL A KRISKOV
21708 57TH AV. SE.
WOODINVILLE, WA 98072

I-198 The proposed-relicensing dams supply energy to near-by mill. don't need them. Conservationists have presented the mill with an efficiency plan that would save as much or more power than the dams provide. The D.E.IS fails to mention this! Paul Kriskov

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OFFICE OF THE SECRETARY
91 JUL 24 PM 2:16

RESPONSES TO INDIVIDUALS

I-198: Refer to response I-163.

JOHN M. THOMS
8140 Indian Hill Road
Cincinnati, Ohio 45243

Jon:

I-199 I have enjoyed Olympic National Park and I object to the FERC report that favors relicensing of the Elwha and Glines Canyon Dams.

I join the Klallam tribe, local residents, and various members of Congress in the fight to restore the runs of the spawning fish.

The exploitation of such public land for private gain is inexcusable. What are you doing to rectify the error of the FERC? Please write and let me know your progress in restoring these ancient runs.

Best Regards,

JRMThoms

I-199: Your opposition to licensing the projects is noted.

Ms Debra A. Christy
125 Dalmagro Rd
Lot 31
Butler, PA 16001

Louis Caskell
Federal Energy Regulatory Commission
825 North Capitol Street
NE, Washington, DC, 20426

To Louis,

I-200 I have read your article on FERC. I received the July/August magazine and read the article on FERC. I totally support releasing the two dams. Until I read your article, I didn't know the situation was becoming this serious.

I ~~suggest~~ Recommend this segment to be sent to me. I would like to know more about this segment.

Concerned Citizen,
Ms Debra A. Christy

I-200: Comment noted.

COMMENTS OF INDIVIDUALS		RESPONSES TO INDIVIDUALS

I-201

7-5-91.

Dear Mr. Cashell,

Please do reconsider relicensing the 2 dams that would help trout and salmon runs. The Olympic Nat. Park is part of Washington's image, a jewel that already has been greatly marred by extensive clearcutting. Some day we — the people, tourists — won't be able to really [illegible] of it any more. Thank you.

[illegible]

91 JUL 22 PM 3:41

I-202

23 July 1991

Please reconsider you support for relicensing the dams at Olympic National Park. Let's practize conservation at the paper mill (they were presented with a plan) and restore commercial fishing and tourism to the area!

Thank you!

Debbie & Andy Dalquist
12728 Waterman Drive
Raleigh NC 27614

I-201: Your opposition to relicensing the projects is noted. Staff notes that clearcutting does not take place in Olympic National Park, although it does occur, legally, in the surrounding Olympic National Forest.

I-202: Your opposition to licensing the projects is noted.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

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